Industrial Electronic Engineers, Inc.

ScanVue5®
User Manual

(U.S. Patent No. 6,213,394 B1)

ScanVue5® Mini Kiosk
User Manual

M37574–01T

Industrial Electronic Engineers, Inc.

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STANDARDS CERTIFICATION

The ScanVue5® product described in this manual has been fully tested and certified by an independent testing laboratory and is compliant with the following international standards.

- UL Standard 60950 (ITE) listed product.

- CSA standard C22.2 No. 950 recognized product.

- CFR Title 47 part 15, Class B

- EN55022,1998 Class A, EN55024,1998, EN61000-3, EN61000-4

The Metrologic™ scanner mounted in the underside of the ScanVue® Price Verifier unit complies with the following standards and regulatory requirements for CDRH Class IIa laser devices:

- 21 CFR, Parts 1040.10 & 1040.11, Class IIa Laser Product.

- CUL listed 94J8 I.T.E.

- CFR Title 47 part 15, Class A

- ICES–003 Class A

- EN60825–1:1994/A11:1996. 0.681 milliwatt (Peak)

The internal PC Card radio is certified by the manufacturer to be compliant with the following standards:

- CFR Title 47 part 2

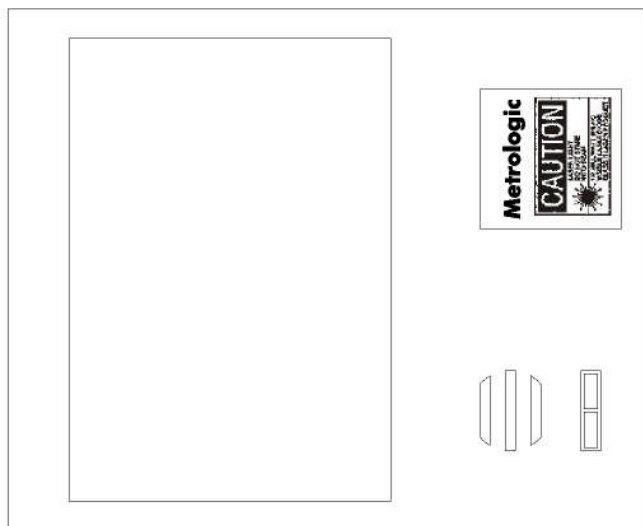- ICES–003 Class A

- US—FCC part 15.247; Europe—ETS 300 328; Japan—RCR STD-33

CAUTIONS

Caution—THE METROLOGIC™ BARCODE SCANNER USES A VISIBLE RED LASER DIODE.

☼ **LASER LIGHT DO NOT STARE INTO BEAM**

Caution—USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

Caution–Label Placement on Barcode Scanner

CAUTION

LASER LIGHT
DO NOT STARE
INTO BEAM

1.0 MILLIWATT (PEAK)
VISIBILE LASER DIODE
CLASS II LASER PRODUCT

Caution–Label Enlarged

Caution: DO NOT DISPLAY A FIXED IMAGE FOR EXTENDED PERIODS OF TIME AS THIS MAY CAUSE A PERMANENT LATENT (GHOST) IMAGE ON THE LCD. THE WARRANTY DOES NOT COVER THIS EFFECT.

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Chapter 1—Introduction

What's in this Manual

This manual provides instructions for installation and operation of the IEE ScanVue5® Price Verifier. Chapter 1 introduces the ScanVue5® hardware and describes its basic functions and features. The following chapters describe how to physically install the unit in its intended location, configure and set up your specific network and interface ScanVue5® to a back office server through its Application Programming Interface (API).

The current software version number is displayed on the first status screen appearing after powering up the unit (if properly configured). A barcode is available to display the status screen directly (Appendix A); the host can query the unit for the same information. Software updates, the entire CD-ROM SDK contents and later versions of this manual are available on IEE's FTP web server at www.ieeinc.com.

Be aware that ScanVue5 models running V5.x software cannot be upgraded to V6.x software as the hardware platform is different. The same server application will work with both software versions with the exception that some features supported in V6.x may not be supported in V5.x.

Revision R of this manual is current with software version V6.20.   Certain features may not be supported in earlier software versions or hardware platforms.   User Manuals specific to software versions and hardware platforms can be obtained on request.

ScanVue® Models

The ScanVue® can be configured as a kiosk or as a price verifier. In its kiosk form it may be sold with touchscreen, printer, keypad, magnetic stripe reader, barcode reader and LCD display. Each input device is optional so that in its price verifier form it consists of a number of different models that appear externally identical but have different features. Model TA05–2XX is a hard–wired only unit with a ¼ VGA color AMLCD display. Models TA05–1X and TA05–3X have an optional 11Mbps (IEEE 802.11b) wireless–network interface installed, while Model TV42–XX has a 4x20 fixed width character vacuum fluorescent (VF) display with optional wireless–network. Each of these models have an optional bank of 4 switches on the front panel. These switches have no pre–assigned functions but when depressed send the switch number and time–open and –close events to the host computer. Models with a co-located Citizen printer (uses the same power supply for the printer and ScanVue5 and shares a dual mounting bracket), keypads and a magnetic stripe reader are available. AMLCD models also have a 16x12 digital touch screen available that operates in a similar way to the switches, sending the X,Y co-ordinate of the location on the screen when touched.

All these models are transparent to the API—that is, they may be interchanged without having to modify host computer software or your network. A sister product, ShopVue5® which uses the same display in a slim housing without the scanner can also co–exist on the same network. It operates from the same software and can be used in locations where only the advertising is needed such as a checkout stand.

ScanVue5® Description

ScanVue5® is a multi–function price verifier designed to allow a retail store customer to check the price of any UPC barcoded product without having to leave the aisle or shelf area. As well as displaying the price and description of scanned items, ScanVue5® color graphics LCD can display specials or promotions, manufacturers co-op advertising, check gift card balances or provide other customer information. Thus, as well as performing a service to the customer, ScanVue5® can directly generate advertising revenue for the store. The advertising display can be sequential still images (slides), short animation clips, text, graphics or a mix of all these types of display. The contemporary housing design merges well with almost any store décor and custom color combinations are available if the units are ordered in sufficient quantities. A number of different options for mounting the ScanVue5® unit are available.

The ScanVue5® price verifier consists of a barcode scanner located in the underside of the housing, a 5.7", ¼ VGA color graphics LCD display or [optional] 4x20 vacuum fluorescent display, 4 [optional] front panel push button switches that can be used to perform any function required by the end user, and an embedded microprocessor–based controller running an application program that drives the scanner, the push buttons and the graphics display and manages the operation of the unit. Communications between ScanVue5® and the host computer can be hardwired 10baseT Ethernet or wireless 802.11x. An external RS232 serial port is available via an optional Y cable and supports a hand scanner a coupon printer or any other serial device. The electronics package is completely contained in a high impact ABS injection molded case. A metal mounting bracket is shipped with the unit.   The unit meets most worldwide regulatory safety and EMC standards including UL1950, CSA22.2, TUV, FCC, CDRH, NOM and CE.

A new feature of ScanVue5's software is the ability to run a "protocol converter". This means that an existing price-verifier application running on a network server for another type of unit can be converted at the ScanVue5 side to run without a rewrite of the host application code.   Contact factory for quote for a custom protocol converter.

Demonstration Mode

Demo mode provides a functional demonstration of Scanvue in a 'stand alone' mode without the need to connect to a network.   In demo mode, an internal server and item lookup file will display graphic item information when the appropriate item barcode is scanned. The demo program uses multiple level images to show how additional item information can be displayed—for instance, a food item can display a recipe on the second level.

Demo mode is entered by scanning *Demo Mode* and then the *Save and Reset* barcodes.   The unit will stay in this mode until barcoded back to its normal mode. Demo item barcodes are available in the documentation section of the CD-ROM.

Technical Knowledge Required
Installation
The installation of ScanVue5® is a reasonably easy process for a person familiar with installing and maintaining local area networks (LAN's). Although we have provided various software tools to help with the network setup, this manual is not intended to be a

training guide for novice network installers. It is assumed the installation will be done by a person having a sufficient level of technical expertise with LAN hardware and software to understand the content of this manual and complete the job with minimal outside help. A system or network administrator is capable of performing the installation with ease. IEE can provide additional technical assistance in getting the system running, if required.

Operation

Once ScanVue5® units are installed and configured, any person familiar with a PC and able to write simple macros or script files will be able to create graphics–based presentations (called slideshows) using Microsoft WordPad™ or a similar text editor. Image files can be obtained from various sources—downloaded from a website, scanned in from a digital scanner or transferred from a digital camera. Familiarity with a graphics editor program would be helpful in preparing the images for slideshow presentations.

Application Program Interface (API)

An API that provides the interface between ScanVue5® and the network host computer application is described in detail in Chapter 4. The API is written in ANSI "C" and can be integrated with any ANSI 'C' compiler. The database application and its interface to ScanVue5® will generally reside on the network host computer (sometimes called the network server). Numerous different hardware or software platforms may be used as long as TCP/IP is the network transport–protocol. Typical platforms are AS400, VAX, Wintel hardware running Windows NT/2000/ME/XP, Unix, VMS, Oracle, SQL…

The database application program is responsible for receiving a request from a scanner, retrieving the price and description from the database, and returning that data to the unit that initiated the request. The development and maintenance of any host computer based application program required to access a product–information database is the sole responsibility of the end user or their system integrator. IEE provides an SDK including some license free "C" source code to assist the end user in writing applications on their host machine.

ScanVue & RealScan **7802 Assembly Part Numbering System**

The base number for ScanVue will be constructed as follows:

X X X X

Display Descriptor
05 = 5.5 in. Diagonal (Sharp) (04 = 240 X 128 (LC))
42 = 4 x 20 – 5mm   47 = 320 X 240   A5=AU DISPLAY

Display Technology
A = Plain Front Active Matrix   M = Monochrome LCD
B = Button Front
T = AMLCD with Touch
V = Plain Front Vacuum Fluorescent

Style
S = Standard Cabinet
N = NCR Cabinet
T = Thin Cabinet
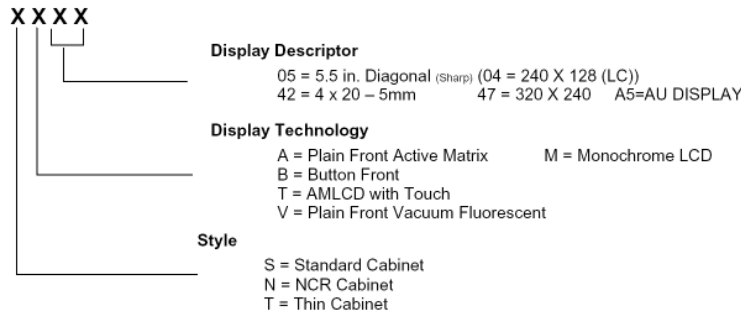
Additional modifiers are assigned as follows:

X X X X X X X X X

SOFTWARE FUNCTION*
0 = STANDARD   B = BROWSER ON LINUX
S = SCANVUE ON LINUX   C = CE

Bezel Color

Color	Logo	Barcode
0 = Gray–Green (PMS 416U)	IEE	IEE
1 = Red (PMS 1805C)	IEE	IEE
2 = Rose (PMS 485C)	IEE	IEE
3 = Blue (PMS 285C)	None	IEE
4 = Red (PMS 1805C)	Cary	Cary
5 = Gray–Green (PMS 416U)	None	Cary
6 = Red (PMS 1805C)	None	Cary
7 = Gray–Green (PMS 416U)	None	IEE
8 = Gray–Green (PMS 416U)	Cary	Cary
9 = Black (FS-595-27038)	Next	IEE
A = NCR Gray (G105)	NCR	
B = Metrologic Lt. Gray (GY–9510)	Metrologic	
C=NCR-CG1 (CHARCOAL GRAY)	NCR	NCR

Housing Color

Color	U Bracket
0 = Gray, IEE Standard	Gray–Green (PMS 416U)
1 = Gray, IEE Standard	DEC Gray
2 = Rose (PMS 485C)	Rose (PMS 485C)
3 = Blue (PMS 285C)	Blue (PMS 285)
4 = Red (PMS 1805C)	Black (FS–595 27038)
5 = Black (FS-595-27038)	Black (FS–595 27038)
A = NCR Gray (G105)	NCR Gray (G105)
B = Metrologic Lt. Gray (GY–9509)	Metrologic Dk. Gray (GY–9510)
C=NCR-CG1 (CHARCOAL GRAY)	NCR-CG1 (CHARCOAL GRAY)

Mounting
B = Backplate   P = Pole   N = Not Supplied   C = Co-LocatedPrinter
R = Rack Mount   S = Stand   W = Wall

Filter
B = Blue   C = Clear (LCD)
G = Green   N = Neutral (Natural VF Aqua)

Power Supply/Cabling
0 = None
2 = 230 V$_{AC}$ Unregulated (CE)   3 = Universal (Multi–Plug)
E = Power Over Ethernet   4 = Universal Japan (-25)

Scanner
1 = Metrologic   (2 = Symbol)   6 = Linear Scanner
(3 = NCR)   (4 = Metrologic Consigned) 7 = Metrologic Quantum
5 = NCR Consigned   N = Not Supplied   A=MSR Only
B= Metrologic + MSR   C=NCR + MSR   D = Metrologic Quantum + MSR

Radio
0 = None   1 = 11 Mb, 802.11b Wi–Fi   4 = 2 Mb, 802.11FH
2 = Symbol 11 Mb, 802.11b   3 = 11 Mb, 802.11b Japan (-10)

Network
0 = None (RS–232)
2 = Wired   3 = Wireless Ready

Controller
0 = None   (1 = DIMM PC)   4 = SC2200 Geode
2 = NetARM   (3 = ZF–86)   5 = Netarm "Lite" (low cost ScanVue)
6= GEODE (LX 800)

*The detailed software functionality my be defined by a seven digit field that follows the ScanVue part number. The seven-digit field is followed by the software revision number. This number appears on the unit label as well as on the ScanVue display screen during Initialization.

Technical Assistance

If you require technical assistance in bringing up your ScanVue5® Price Verifier, please call (818) 787–0311 and ask for Technical Support. Please be prepared to discuss your configuration and setup parameters.

Chapter 2—Installing ScanVue5®

Items Shipped with ScanVue5®

- ScanVue5® with barcode scanner and display. Model options include:
    - ¼ VGA TFT display
    - VFD 4x20 display
    - ¼ VGA Blue/White display (only available with Ethernet and linear scanner)
    - Ethernet 10BaseT or Ethernet+802.11b Wi-Fi.
    - Co-located Citizen label printer
    - 20 Key keypad
    - Magnetic stripe reader
    - 16 x 20 digital touch screen
    - Omni-directional or linear scanner
- A 16VDC/30W AC desktop 'brick' with a standard 8 pin DIN female connector. The input is universal 90-264VAC/50-60Hz and the power supply has global certifications.
- SDK (software developers kit) includes programs for setting up the ScanVue5® unit and the server, API code, demo programs, font files, user manuals in PDF format, and third-party useful utilities.
- Mounting brackets are provided.
- A desktop stand kit is available as an option (P/N 38572-02)
- The following accessories are available.
    - Stand mount kit (IEE P/N xxxxx-02)
    - 6' DC power extender cable with DINF to DINM connectors (IEE P/N 37082–72).
    - Y cable for Symbol Cobra or NCR 7837 hand scanner (IEE P/N 37915-XX).
    - Y cable for NCR 7137 Thermal Printer (IEE P/N 38094-XX).
    - Y cable for NCR K590 Self Service Printer (IEE P/N 38254-XX)
    - Y cable, RS232 Universal with DB9F connector (IEE P/N 38516-07)

Mounting the ScanVue5® Unit

There are two (2) ways the ScanVue5® Price Verifier can be mounted.

1. Wall mounted from the back of the unit.
2. Stand mounted for desk or counter top installation

Wall Mounted

The wall mount bracket is provided as a standard item shipped with the unit (Appendix F for actual dimensions). The wall bracket can be mounted on any type of flat vertical surface using the 6 mounting bosses with holes. The bracket can also be mounted by a special double-sided tape to a glass column or wall. Mounting hardware is not provided as the material used in the vertical wall can vary depending on the location chosen and either wood screws or toggle bolts or equivalent are recommended. Do not use wood screws or sheet metal screws in drywall—they will not hold the weight of the unit.

Note: contact factory for recommendation of double sided tape—do not use the kind you might find in the local drug store or hardware store.

The wall mount bracket is removed from the rear of the unit, sliding it up and off of the 4 vertical tongues, and mounted to the wall, column or endcap. A hole is provided in the bracket for bringing the power and/or network connection through from the wall or column.
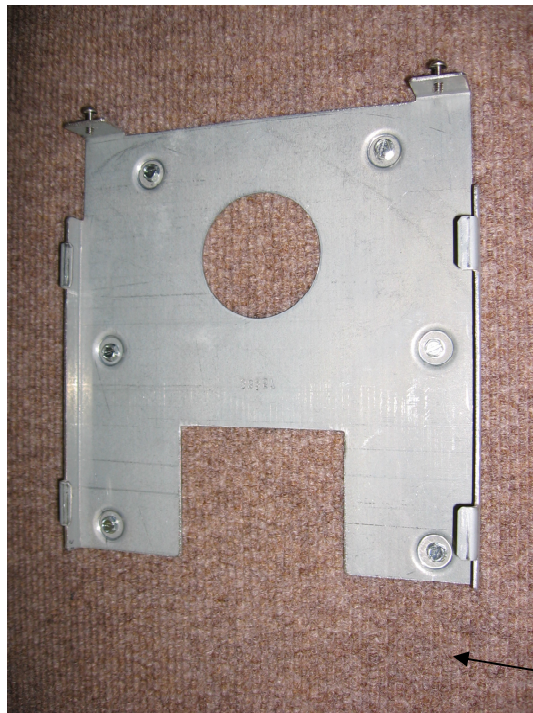
Locking screws (x2)

Fig 1—Wall Mount Bracket

The ScanVue5 unit is pushed close to the wall about 1" above the bracket tongues. Push it downward until the 4 tongues mate securely with their counterpart slots in the rear of the housing. Tighten the 2 locking screws through the slots in the housing until snug—this will prevent anybody from removing the unit from its mount.

A double-wide bracket that places the label printer directly on the left side of Scanvue is provided when the co-located printer option is purchased. The printer and Scanvue are mounted side by side on a sub-panel pre-wired for a single power supply and ready to be mounted to a wall almost exactly like a single Scanvue.

Stand Mount

An optional kit can be purchased (IEE P/N xxxxx-01) for mounting the unit on a desktop or counter top. The stand comes with assembly instructions and a special VESA mount bracket to replace the wall mount bracket. Once mounted on the stand the unit can be swiveled left and right, up and down and raised or lowered to get the best possible position for the scanner.

Fig 2—Optional Stand Mounted

Wiring the Ethernet Model

Once the ScanVue5® unit is mounted in place there are 2 cables (1 cable only if 802.3af IEEE PoE option is selected) that must be connected before it can be operated. For aesthetic reasons we suggest the AC and network outlets are mounted close to (or in) the ceiling or close to the floor. The two cables may also be routed inside the wall or column and plug into the AC and network connections in the ceiling. This is the recommended method and provides the cleanest installation.

1. Plug the RJ45 cable Ethernet cable connected to the hub or switch on your LAN into the RJ45 connector in the rear of the ScanVue5® unit (Figure 6).

2. Connect the 8–pin DIN extension cord and the DIN connector coming from the ScanVue5® unit. Line up the arrows on the two connectors and the pins will be aligned for insertion. On some models, the 8–pin DIN connector is mounted on a PC board that is accessible from the back of the unit underneath the mounting bracket (Figure 6). The RJ45 Ethernet connector is also mounted on this PC board

3. Plug the other end of the DIN extension cord into the DIN connector on the power supply.

4. Plug the power supply into a grounded electrical outlet—the ScanVue5® unit will start its boot–up sequence.

Figure 6—Connector Location—Rear of ScanVue5

Wiring the RF Wireless Model

If you purchased the wireless network option, the 802.11b Wi-Fi card will already be installed and tested at the factory. The installation is the same as shown above for a hardwired unit, except no RJ45 cable is needed for wireless operation.
Installation of RF communication links requires special expertise and is part of your site network and as such the manufacturer of the access point (and your network staff) should be the first line of technical support. Most of the manufacturers of access points have extensive technical documentation on performing RF site surveys and correct installation of the units on their web sites.

Entering the ESSID
Each wireless RF access point has a network name (called an ESSID) that consists of up to 32 letters and numbers. When a new ScanVue5® is shipped from the factory, a default ESSID (INSTALL) is stored in configuration memory. Before it will communicate

with the access point, the ScanVue5® must have a matching, case sensitive ESSID entered into its memory to replace the default. The ESSID can be entered through the ScanVue5® internal barcode reader.

The ESS ID is a barcode label in the following format:

NN nn $x_1 \ldots x_{32}$

where NN=fixed characters, nn=# of characters in ID (1–32)
$x_1 \ldots x_{32}$ = ID (1–32 characters)

Load the ESS ID as follows:
1. Create a barcode label with the ESS ID formatted as described above.
2. Power the ScanVue5® unit and verify the barcode scanner is operational—look at the underside and check the scanner is lit and rotating.
3. Scan the ESS ID barcode you created.
4. Scan the "Save Configuration and Reboot" barcode.
5. The ScanVue5® unit will reboot and should now communicate with the network.

Setting Up a Wireless RF Link
Before installing a new wireless RF data link, it is important to perform an RF site survey to characterize the immediate environment and ensure a reliable system is designed. The general pointers we indicate below will assist in the initial installation and diagnosis of a link problem, however your first line of technical support is the specialized help available from the manufacturer of the access point or your IS or VAR people doing the installation.

1. Unobstructed line–of–sight is best. If you can, arrange the ScanVue5® units so there is an unobstructed line–of–sight to the access point. Under these ideal conditions and assuming no interference from other 2.4Ghz sources, you should get up to 150' distance. In a typical office or retail environment 30'–50' is more typical.

2. Mount the access point as high as possible in the line–of–sight. This way the signals should travel above racks, shelving, customers, etc. The human body is 90% water and a good RF signal absorber—this is why cell phones often don't work well inside buildings and around crowds of other people.

3. Keep reflective surfaces like mirrors and polished stainless steel, and metal objects with sharp points to a minimum and away from the antenna as much as possible.

4. If you are having trouble making a connection, try moving the ScanVue5® closer to the access point, raising it, or lowering it.

   As the ScanVue5® unit cannot easily be moved once installed, it is often more convenient to have a portable signal strength meter or an IEEE802.11b RF NIC card in a laptop computer during installs. The NIC driver will have a RSSI graph or will display the signal strength as a percentage depending on the NIC used.

Adding a Hand Scanner

If your ScanVue5® has software version 4.12 or later, a hand scanner on a cable may be installed in addition to the fixed scanner. The hand scanner is useful for departments that sell large items that cannot easily be read by the fixed scanner. ScanVue5® works with either scanner transparently—that is, either the fixed scanner or the hand scanner can be used to read an item barcode without having to select which one is being used.

Two manufacturers hand scanners are supported. The Symbol Cobra 1902T scanner requires an optional ScanVue5® power supply Y cable (IEE P/N 37915–XX, where XX specifies the cable length) that provides the additional RS232 port, serial port 2, for the hand scanner to connect to the ScanVue5® unit. The Cobra scanner comes with its own wall mount power supply to power the scanner and is required in addition to the power supply that powers the ScanVue5® unit. The RS232 port is factory pre-set to run the hand scanner. The NCR model 7837 construction and cabling is almost identical to the Cobra and supported in the same way. The following paragraphs describe setting up the Cobra scanner in detail. A similar setup is required for the NCR scanner.

Wiring and Configuring the Hand Scanner

Once the Cobra scanner is powered up, it must be configured to communicate with ScanVue5®. Section 4 of the Cobra manual contains the barcodes required to perform the setup needed. A manual can be obtained from the Symbol website **www.symbol.com** if you don't have one. Scan the following barcodes in the order shown in Table 1.

Barcode	Cobra Manual Page #	Note
Set all defaults	4–10	
Standard RS232C	4–23	Default: 7–bit, odd parity
RTS/CTS option 2	4–30	
Scan Suffix	4–116	
1	4–119	Numeric bar code
0	4–119	Numeric bar code
1	4–119	Numeric bar code
3	4–119	Numeric bar code
Scan Options	4–117	
<DATA><SUFFIX>	4–117	
Enter	4–118	

Table 1—Cobra Scanner Setup Codes

Y Cable
Part No. 37915

Power supply
provided with
ScanVue5

RS232 connector

Symbol Cobra Scanner

Cobra Scanner Power Supply

Power supply and RS232 cables provided with Cobra scanner
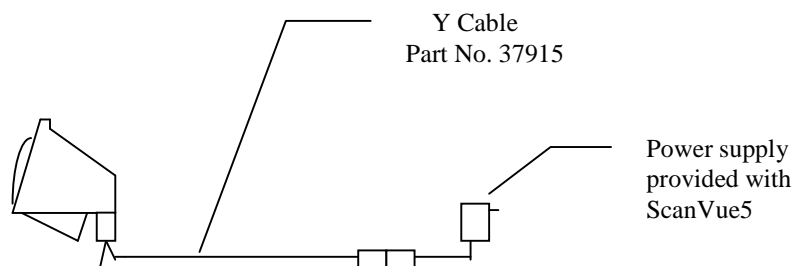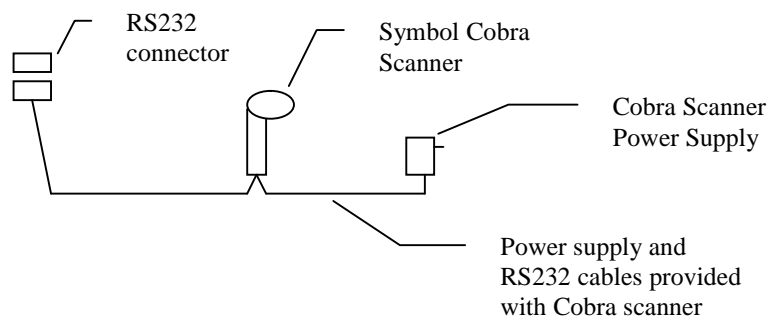
Figure 7—Wiring Cobra Hand Scanner

Adding a Serial Printer

Software versions 4.16 and later provide support for an external serial printer as well as a hand scanner. The factory default setting for serial port 2 is **SCANNER** for hand scanner use. If a serial printer is required instead of the scanner, serial port 2 must be changed to **OUTPUT** or **BIDIRECTIONAL** using UnitConfig or the modeset commands. The port may also be disabled by setting it to **NONE**.

In **OUTPUT** mode the port parameters are pre-configured for the NCR model 7197 Thermal Receipt Printer. You must also purchase a special Y cable (IEE P/N 38094–XX, where XX specifies the cable length) which breaks out the RS232 port for the printer from the DIN power connector on the rear of Scanvue.

In **BIDIRECTIONAL** mode the port parameters are pre-configured for the NCR model K590 Self Service Printer. A Y cable (IEE P/N 38254–XX) is required to connect this printer to ScanVue5®. The K590 printer has built-in sensors and diagnostics to detect error conditions that can be reported back to the server through this port.

Other manufacturers serial printers may require a different Y cable or port settings. Check with the factory before attempting to connect a different printer.

In **OUTPUT** or **BIDIRECTIONAL** mode, serial port 2 is a transparent RS232 data port. ScanVue5® receives pre-formatted data and control codes from a printer driver resident on the network host, which it passes, unmodified, through serial port 2 to the printer. Any data returned from the K590 printer in **BIDIRECTIONAL** mode will be passed up to the network host unmodified. Printer drivers are specific to the printer used and must be provided by the user.

Wiring and Configuring the Serial Port

Use the UnitConfig program or modeset utility to change the serial port configuration to **OUTPUT** or **BIDIRECTIONAL**. If you are using an MS Windows system, open a DOS box and change to the C:\POS directory where modeset is stored and send the 2 following lines. The modeset utility, found on the CD-ROM, must be copied onto your server before these commands can be sent.

```
C:\POS  modeset  -iPort2function=OUTPUT {BIDIRECTIONAL} <IP> ↵
C:\POS  modeset -c -r <IP> ↵
```

where <IP> is the unit's IP address.

The default serial port 2 settings for **OUTPUT** are 9600 baud, no parity, 8 data bits, 1 stop bit for and for **BIDIRECTIONAL** are 19200baud, no parity, 8 data bits, 1 stop bit. The printer port settings must be set to the same parameters to be able to communicate with it. If you want to run the printer faster or change other parameters, a utility program **PortSet** is provided on the CD-ROM for modifying serial port settings.

Sending Data to the Printer

The host server must use nominal-mode ProductInfo packets to send data to the printer (see Chapter 5). The packets required are **Data** type, **Special Text** sub-type. An example of a typical message is:

Byte Count	Value (0h)	Meaning
0-3	00 00 00 13	Length of packet (19 bytes)
4-7	44 41 54 41	'DATA' Data type
8-11	53 50 45 43	'SPEC' Special Text sub-type
12-18	48 65 6C 6C 6F 21 0A	'Hello!<LF>' Text sent to printer

Y Cable
Part No. 38094
or 38254

Power supply
provided with
ScanVue5

DB9 female
connector
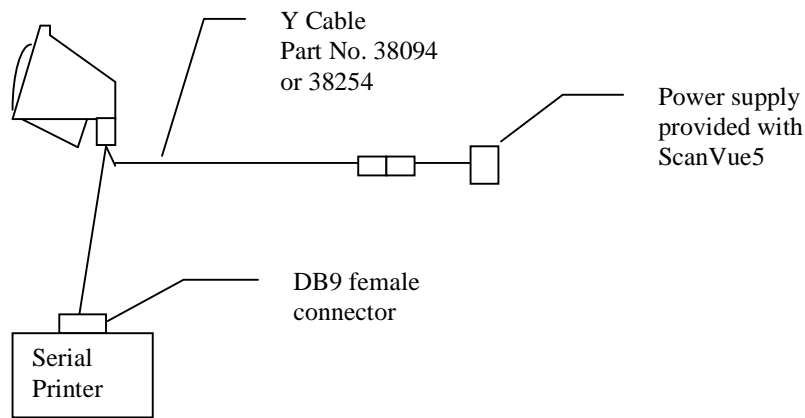
Serial
Printer

Figure 8—Wiring a Serial Printer

Connecting To the USB Port

A Type I, USB 1.0 port is available on the rear panel. The USB port does not provide power to the load device.   Any standard USB cable will connect this port to a device such as a printer. The LX800 has three sockets, the one closest to the motherboard is NOT connected electrically; it is there for spacing only.
The USB port is currently used to connect an external Magnetic Stripe Reader (MSR). See the section under Port3Configuration for more details.

Wiring Precautions

While ScanVue5® is designed to withstand power and data line surges, spikes and other anomalies in accordance with IEC and CE specifications, it will probably not survive a direct lightning strike. In parts of the USA and worldwide where there is a high likelihood of thunderstorm activity it is good practice to install lightning surge protectors on all power and data lines. ScanVue5® should be treated like any other network and computer product installed in your facility.

Chapter 3—Installing the Software

Note: it may be easier to follow the step by step Quickstart Guide (available on the CD ROM in the documentation section).

Before installing the Scanvue5 programs, we highly recommend you install the latest updates or service packs to the operating system you are using. The UnitConfig program especially requires a minimum level of Internet Explorer to be running. On Windows 98, IE Explorer 6.0 or later and NT or XP require IE Explorer 5.50 or later.

The *SetupServer* program on the CD–ROM must be run on your Windows network server to create a specific ScanVue5® directory called **POS** on your servers' hard disk, share it and copy the default **scanvue.ini** file into this directory. ScanVue5® units look for this file in the **POS** share when they boot up and will not operate if they can't find it. In software versions after and including V5.02, the .ini file will be searched for in all lower case characters. This takes care of servers that are case sensitive (such as Unix)

You should also install *UnitConfig* the graphical, table oriented version of modeset on the server as it provides the easiest way to change the configuration of a unit on the network (as opposed to scanning barcodes or sending modeset commands). You may also install *UnitConfig* on a desktop or laptop computer for setting up ScanVue5® units without a large network complicating it. You will need a network interface card (NIC) installed in your PC and configured properly to communicate with ScanVue5®. *UnitConfig* version 3.3 or later can also be run directly from the CD-ROM.

For servers that are running other than Windows, sources are provided for the server software. There are also freely available drivers to allow any operating system to act as a Windows–type server.

Important: Scanvue5 V6.2 and later software will detect either scanvue.ini or realscan.ini files. This ensures that an existing NCR installation using realscan.ini will work with new Scanvue units. The shared ScanVue directory and the file must be on the server and the ScanVue5® unit must be able to find it when they power up. If you want to change the operating modes (or configuration) of a specific unit anytime after the system is up and running, the **UnitConfig** program is available in the POS directory or on the CD-ROM.

Server Install

When you place the IEE SDK CD–ROM (p/n 37720-01) into a drive, the autoplay feature will open a window with the folders and program icons. If it doesn't start on its own, click Windows **START** button, then **Run** and enter the CD-ROM drive name (usually d:) in the text box and click **OK**. The CD will open a new window–double click the IEE folder. Click on the IEE icon *SetupServer* and the install program will lead you step by step through the process of creating the **POS** directory, sharing it, and copying the scanvue.ini file into the directory.

Server install also creates a font directory under **POS** and loads all the fonts on the CD–ROM into this directory. ScanVue5® has one default font programmed into the unit. This is a 16x32 pixel glyph containing all 256 characters of the extended ASCII character set—thus any Latin based language can be supported from this font set.

Unit Configuration

Click on the IEE icon **UnitConfig** in the root directory SDK CD–ROM window and the Unit Configuration program will be installed in a subdirectory under POS. This program, which consists entirely of the one screen shown in the section on using **Unit Configuration**, implements the specific set of commands and controls defined in the API for ScanVue5® (see Chapter 5). The program is written in Visual Basic® and the sources and an OCX are provided on the CD–ROM so users can write directly to this program and make or initiate mode changes from their application program

ScanVue5® Software Updates

There are 2 basic models of ScanVue5®, which utilize different internal processors and operating systems. This is transparent to the customer and the API user and there are no external functional or physical differences between the models with the exception of the process for online software updates. Future software releases will include both update methods for both types of units.

When new software is loaded into ScanVue5®, the file image is written into RAM memory. A CRC is calculated and compared with the CRC appended to the file sent from the host. If the two CRC's are identical, the file has been loaded without errors and it is then written into flash memory. The unit will reboot itself and run the new software.

The model type can be easily identified by the software version number on the status screen when the unit is booted.

Chapter 4—Network Configuration

Introduction

ScanVue5® is a network–connected device which uses industry standard TCP/IP protocols for communication. Connecting ScanVue5® to your network requires the same kind of preparation as connecting a workstation to your network. This manual assumes you know how to obtain the relevant information about your existing network configuration and choose the appropriate configuration parameters so your network will recognize ScanVue5® devices. We suggest using switches rather than hubs to connect to ScanVue5® units as the bandwidth and response time is improved.

ScanVue5® supports two activities—displaying item price and description and displaying a graphics slideshow. The unit has two primary modes of operation: an idle mode where a slideshow from 2 to 50 sequential images is continuously displayed, and an interactive mode where a customer scans an item and price and description information is returned by the host server. The four buttons on the front panel can be configured to only be active when in the interactive mode. In order to display product information, ScanVue5® must connect to a host computer that has the product information stored in its database.

If you are using an MS Windows network, we highly recommend Windows NT, 2000, ME, or XP. Windows 95 and 98 can be used as a server for ScanVue5®, but they are not supported. NT 4 Server and Windows 2000 will provide the best performance in terms of response speed, especially if you are using an RF wireless system rather than hardwired Ethernet (10/100baseT).

Network Activity

ScanVue5® includes servers for FTP (port 21), ProductInfo (port 1283), and clients for FTP, SMB (Windows networking), ProductInfo (Product Information Protocol) and QFX (Quick File eXchange). FTP, SMB or QFX can be used to get the graphics files for ScanVue5®'s slideshow. SMB is the default mode.

ScanVue5® ships from the factory with the following default network settings.

IP Address:	DHCP[1]	Sub–Net Mask:	255.255.0.0
Unit ID:	ScanVue5®		
User Name:	GUEST	Password:	(none)
Windows Server:	SVSERVE	Windows Share:	POS
Wireless	TRUE (unencrypted)		

[1]Some hard–wired only models default to 10.0.0.227

ScanVue5® requires a file server for storing graphics files and a ProductInfo server (host or back office computer) for the price/description database. These servers may be (but don't have to be) on the same physical computer. The file server must have the ScanVue5® initialization file (ScanVue.ini) in its **POS** shared directory (if SMB–based) or the default directory for FTP or QFX, and may also have font, graphic, and slideshow script files. The file server can be a Windows system, or an FTP or QFX server on any type of hardware or OS provided it runs TCP/IP.

ScanVue5® sends the UPC number read from a barcoded item placed under the scanner to the 'ProductInfo' server on the host computer which uses this number as a key to find the item in the price and description database(s). After the item records are retrieved, the host application prepares the response and sends it back to ScanVue5® where the information is displayed. The response can be text only, graphics only or a combination of text and graphics.

ScanVue5® Configuration

There are three ways to configure a ScanVue5® unit:

1. Using its internal barcode reader to scan special purpose barcodes.

2. Commands sent across the network using the UnitConfig or modeset programs

3. Following the procedure in the 'Quickstart Guide'. Of course ScanVue5® must be able to communicate with the server on the network before its configuration can be changed on the network.

If you are using wireless RF units, you must enter the ***ESSID of the access point*** you are communicating with via the barcode reader before the unit will associate with the access point. Additionally, if your network uses ***WEP or WPA***, ScanVue5® must be setup to match the access point.

Quickstart
The CD–ROM contains the 'Quickstart Guide for Scanvue5' (P/N 37681–01). The guide applies to all Scanvue5 models and describes how to simply configure your units to match the network settings using a desktop PC and a crossover cable or a passive hub (see page 4). This is the easiest way to bring up the first few units without the added complications of a large network.

Configuration Information Screens
When ScanVue5® boots up, two configuration status screens (Fig. 9 and 10) are sequentially displayed which show the current settings of the unit. Each screen is displayed for 10 seconds then the unit will load the slideshow from the server and start running. These screens can be displayed at any time by scanning the 'show config screen 1' and 'show config screen 2' bar codes shown in Appendix A. In software versions later than V4.15, wireless RF configurations display brown text on a light green background and hardwired Ethernet units display yellow text on a blue background.
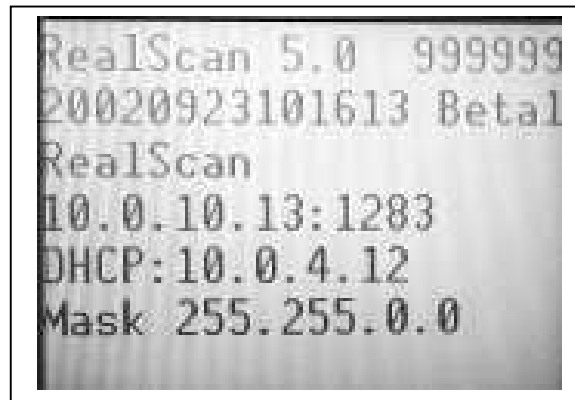
Figure 9—Configuration Status Screen 1
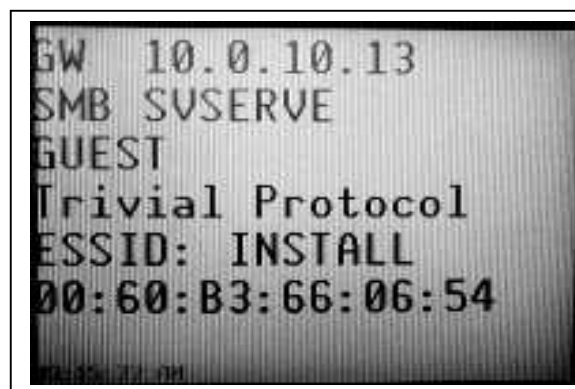
Figure 10—Configuration Status Screen 2

Wireless Configuration Information

Three wireless radio link parameters are kept in the UnitConfig program. These parameters are stored by the radio and give the end user a feel for the link quality and the physical placement of the ScanVue5 unit. The 3 parameters are

Mode	Content
Link	Outrageous, excellent, good, fair, poor (quality of link in 1 of 5 categories)
Level	-256 dBM (signal level in dBM, lower number is better)
Noise	-136 dBM (noise level in dBM, higher number is better)

UnitConfig Program

Configuring ScanVue5® units over the network requires a GUI program called ***Unit Configuration*** which is installed from the CD–ROM. Generally, configuration by special barcode is kept for those occasions when a devices network configuration is incompatible with the local network. Changes can be made off–line that will allow the unit to connect to the network, just like the 'Quickstart Guide", but without needing the PC. Appendix B

describes this method. Once the unit is network compatible the rest of the configuration can be done through *Unit Configuration.*

Unit Configuration is a VisualBasic® program that provides a simple graphical way to query and configure any ScanVue5® unit. It uses the ScanVue5® mode commands (Chapter 5) to setup the unit. This program is available in both source and executable form.

Modeset is a DOS command line program equivalent to **UnitConfig** that can query and set modes through a text file or directly from the directory prompt.

Ex: modeset [mode value]	sets the mode to the specified value
modeset –g [mode]	returns the value of the mode
modeset	lists all non-hidden modes and their values

Using Unit Configuration

When the program is first started, all boxes in the screen are blank. Enter the IP address of the ScanVue5® unit you wish to change in the *Unit IP Address* box. Click the *Read Modes* button–all the *Modes* and their *Content* (values) will be read from the subject unit and displayed as shown in Fig. 9.

To change a mode; highlight the *New Content* box in the same row as the mode you want to change by clicking on it. Enter the new value in the box and click the *Set Mode* button. If the value is accepted, the box and the button will turn green. If it is not accepted, the box and button will turn red. Now click the *Commit* button, this will commit the change to flash memory in the ScanVue5® unit. Multiple changes can be made before committing them. If any of the changes are not accepted, the *Set Mode* button will turn red and those changes marked in red were not made.

Clicking the *Close* button will blank the screen including the IP address box and allow a new IP address, hence a new unit to be selected.

Clicking the *TextReset* button will apply changes made to text modes so they can be seen immediately. As with other modes, the changes are not permanently stored until the *Commit* button is clicked.

The *SaveToFile* button will save the setup to a text file where it can be stored and printed if necessary. This is usually done for troubleshooting or maintaining hard copy records of each unit's configuration.

The *Restart Unit* button will cause a 'soft boot' of the selected unit.

Clicking on the *Help* button brings up a help screen that is a brief overview of how to use the program. Additionally, the light color area at the bottom of the screen will display context sensitive help for each mode as the mode is highlighted. For some modes, the values available are indicated in this area. Other modes (for example *Serial Number*) cannot be changed and will always turn the *New Content* box and *Set Mode* button red.

The *Exit* button closes the Unit Configuration program.

Figure 11—Unit Configuration (UnitConfig) Screen

Configuration Rules

1. Set the *UnitIP* to **DHCP** to have ScanVue5® obtain its IP Address from a network DHCP server.
2. You may specify any or all of the types of file servers. The one that will be used is determined by the *ServerType* mode.
3. The value **–default–** has a special meaning: it will return that mode to the factory default value.
4. "named servers" are available on software versions 6.10 and later. The 3 modes **SloppiIP, AlternateSloppiIP** and **QFXServer** which are the host, host backup and demoserve
5. a name of up to 12 characters or the IP Address.
6. A complete UnitConfig AMLCD mode table is shown in fig 12A. This file is printed as a text file from the UnitConfig "SaveToFile" command. Fig 12B shows a VFD mode table.

Mode	Content
Version	6.20x AMLCD
dateTime	20030303120301
buildInfo	20060726143227
productName	ScanVue
serialNumber	999999
unitID	ScanVue
unitIP	(via DHCP)
unitMask	255.255.0.0
gatewayIP	10.0.10.13
domain	(Not Set)
DNS	10.0.10.13
windowsServ	SVSERVE
shareName	POS
WINSserverIP	10.0.10.13
FTPServerIP	10.0.10.13
userName	GUEST
password	(Not Set)
SLOPPIHost	(Not Set)
AlternateSLOPPIHost	(Not Set)
sloppiport	1283
SLOPPITimeout	300
QFXHost	(Not Set)
QFXport	1284
QFXTimeout	300
KeepAliveTime	0
textRows	7
textCols	20
textHPos	0
textVPos	8
textForegnd	35
textBackgnd	180
TextDisplay	EXCLUSIVE
TextTransparent	FALSE
Port2Function	Scanner
Port2Input	Line
POStimeout	30
PointerHScale	31
PointerVScale	23
RegisterINI	TRUE
RegisterStart	TRUE
SingleQTrans	FALSE
IgnoreAckNak	FALSE
IgnoreResponseChars	0
QueryPadTo	0
BypassNCRprefix	TRUE
NoBarcodes	FALSE
QueryPrefix	(Not Set)

ShowShortPoll	60
ShowLongPoll	300
TrivialComm	TRUE
sendUnitID	TRUE
sendError	FALSE
sendResponse	FALSE
NTPhost	10.0.10.13
NTPTZoffset	480
eventStart	00000000
eventEnd	00000000
user1	(Not Set)
msgChecking	" Checking... One moment please "
msgUnavail	" Unavailable Please try later "
DisplaySetup	5
DisplaySetup2	5
DisplayAll	FALSE
ShowLogo	TRUE
WallPaperEvent	00000000
NetworkName	INSTALL
Diversity	PRIMARY
Wireless	TRUE
WEPEncryption	None
WEPKey1	(Not Set)
WEPKey2	(Not Set)
WEPKey3	(Not Set)
WEPKey4	(Not Set)
WEPKeyIndex	1
BasePrefix	(Not Set)
HomeURL	(Not Set)
URLPrefix	(Not Set)
URLSuffix	(Not Set)
vPrefix	(Not Set)
vSuffix	(Not Set)
btPrefix	(Not Set)
btSuffix	(Not Set)
ScreenBlank	0
BDelay	0
MacAddr	00:e0:98:f5:84:6f
Link	100
Level	228
Noise	0
msrPrefix	(Not Set)
msrSuffix	(Not Set)
PLUFile	
SSHPassword	********
AllowSSH	TRUE
DebounceKeypad	TRUE
ProductCode	38196-01-620x
LocalHost	FALSE
Port3Function	(unknown)

```
Port3Input          Character
UseWPA              FALSE
wpaScanSsid         TRUE
wpaKeyMgmnt         None
wpaPairwise         None
wpaGroup            None
wpaEAP              None
wpaPSKPassphrase        (Not Set)
wpaIdentity         (Not Set)
wpaPassword         ********
wpaCACert           (Not Set)
wpaClientCert       (Not Set)
wpaPrivateKey       (Not Set)
wpaPrivateKeyPasswd    ********
wpaPhase1           (Not Set)
wpaPhase2           (Not Set)
wpaProto            (unknown)
wpaCACert2          (Not Set)
wpaClientCert2      (Not Set)
wpaPrivateKey2      Not Set)
wpaPrivateKey2Passwd   ********
ServerType          SMB
```

Figure 12A—Unit Configuration V6.20 AMLCD

```
Mode                Content

Version             6.20x VFD
dateTime            20030305114715
buildInfo           20060724035241
productName         ScanVue
serialNumber        999999
unitID              ScanVue
unitIP              (via DHCP)
unitMask            255.255.0.0
gatewayIP           10.0.10.13
domain              (Not Set)
DNS                 10.0.10.13
windowsServ         SVSERVE
shareName           POS
WINSserverIP        10.0.10.13
FTPServerIP         10.0.10.13
userName            GUEST
password            (Not Set)
SLOPPIHost          (Not Set)
AlternateSLOPPIHost     (Not Set)
sloppiport          1283
```

```
SLOPPITimeout      300
QFXHost            (Not Set)
QFXport            1284
QFXTimeout         300
KeepAliveTime      0
ExtCharacterSet    EUROPEAN
Port2Function      Scanner
Port2Input         Line
POStimeout         30
RegisterINI        TRUE
RegisterStart      TRUE
SingleQTrans       FALSE
IgnoreAckNak       FALSE
IgnoreResponseChars 0
QueryPadTo         0
BypassNCRprefix    TRUE
NoBarcodes         FALSE
QueryPrefix        (Not Set)
ShowShortPoll      60
ShowLongPoll       300
TrivialComm        TRUE
sendUnitID         TRUE
sendError          FALSE
sendResponse       FALSE
NTPhost            10.0.10.13
NTPTZoffset        480
eventStart         00000000
eventEnd           00000000
user1              (Not Set)
msgChecking        "   Checking...    One moment please  "
msgUnavail         "   Unavailable     Please try later  "
DisplaySetup       5
DisplaySetup2      5
DisplayAll         FALSE
ShowLogo           TRUE
NetworkName        INSTALL
Diversity          PRIMARY
Wireless           FALSE
WEPEncryption      None
WEPKey1            (Not Set)
WEPKey2            (Not Set)
WEPKey3            (Not Set)
WEPKey4            (Not Set)
WEPKeyIndex        1
BasePrefix         (Not Set)
HomeURL            (Not Set)
URLPrefix          (Not Set)
URLSuffix          (Not Set)
vPrefix            (Not Set)
vSuffix            (Not Set)
```

btPrefix   (Not Set)
btSuffix   (Not Set)
BannerText   "   SELF SERVICE\x0A   PRICE VERIFIER\x0AScan your item belowfor price/sale info!"
ScreenBlank   0
BDelay   0
MacAddr   00:60:b3:79:2d:c6
Link
Level
Noise
msrPrefix   (Not Set)
msrSuffix   (Not Set)
PLUFile
SSHPassword   ********
AllowSSH   TRUE
DebounceKeypad   TRUE
ProductCode   38196-02-620x
LocalHost   FALSE
Port3Function   (unknown)
Port3Input   Character
UseWPA   FALSE
wpaScanSsid   TRUE
wpaKeyMgmnt   None
wpaPairwise   None
wpaGroup   None
wpaEAP   None
wpaPSKPassphrase   (Not Set)
wpaIdentity   (Not Set)
wpaPassword   ********
wpaCACert   (Not Set)
wpaClientCert   (Not Set)
wpaPrivateKey   (Not Set)
wpaPrivateKeyPasswd   ********
wpaPhase1   (Not Set)
wpaPhase2   (Not Set)
wpaProto   (unknown)
wpaCACert2   (Not Set)
wpaClientCert2   (Not Set)
wpaPrivateKey2   (Not Set)
wpaPrivateKey2Passwd   ********
ServerType   SMB

Figure 12B—Unit Configuration V6.20 VFD

Network Security
WEP Types
ScanVue5® supports 2 different types of WEP (Wireless Equivalent Privacy) encryption in software versions 4.12 and later. WEP encryption is set by the WEPEncryption mode.

WEPEncryption Mode Value	Function
NONE	WEP encryption off
OPEN40	Open System 40–bit encryption
OPEN128	Open System 128–bit encryption

WEP Description
There are 4 unique encryption keys WEPKey1 through WEPKey4. Each key contains 10 hex digits for 40–bit encryption or 26 hex digits for 128–bit encryption. Default value of the keys is a string of zero digits of the appropriate length.

The mode WEPKeyIndex determines which of the 4 keys is used. The default is WEPKey1. The selected key must match the type of encryption selected. For example; if WEPEncryption is set to SHARED128 and WEPKeyIndex is set to WEPkey2, then WEPkey2 must contain 26 hex digits (or 128 bits). WEPkeyindex and the encryption data can be set by barcode in software versions after 6.12.

Note: If the encryption type is changed, ScanVue will not verify the keys already stored are appropriate for the new type.

Exception—If you are using Symbol Technologies access points, they do not support Shared System WEP encryption.

Setting WEP
Before you start:

1. The WEP encryption mode and WEP keys for the network you are installing to must be known.
2. The WEP encryption mode and WEP keys in the access point and the Scanvue5 unit must match exactly or they will not associate.
3. When installing and configuring a new or replacement Scanvue unit into a network running WEP, you must disable WEP at the access point or the Scanvue5 unit will not associate with it.
4. WEP keys are set using the UnitConfig program.
5. If you do not want to disable WEP on your network, an alternative method is to bring up the Scanvue5 unit offline, for example on a laptop, to set the WEP keys—all the rules still apply but the WEP keys can be loaded without disabling WEP on your network and UnitConfig can be run locally rather than on the network server.
6. The 3rd option for loading WEP keys is by barcoding them into the unit. You must be able to generate and print the necessary barcodes to use this method.

Loading WEP Keys from Network
   1. This procedure applies to either on-line or off-line computer connections
2. Disable WEP in the access point and boot up the Scanvue5 unit. It should boot up and associate (connect) with the access point.
3. Run the UnitConfig program.

4. Select **WEPEncryption** mode and set its value to one of the 3 choices shown in the table above. If WEP if not being used, leave its default setting of NONE.
5. Select **WEPKey1** through **WEPKey4** and set all 4 key values.
6. Using **WEPKeyIndex** set the key value you are using.
7. Commit the changes and reboot the Scanvue unit. New WEP settings will take effect when the unit has finished rebooting.
8. Enable WEP on the access point–provided the WEP encryption mode and WEP key selected on Scanvue5 matches the access point settings, Scanvue5 will associate (connect) seamlessly.

Loading WEP Keys by Barcode

1. The unit does not have to be connected to a computer to load WEP keys by barcode.
2. Preferred format is Code 128 and hex digits A-F should always be upper case
3. Set the WEP encryption mode being used.

WEP encryption mode	Function	Barcode
NONE	WEP encryption off	WE4NONE
OPEN40	Open System 40–bit encryption	WE6OPEN40
OPEN128	Open System 128–bit encryption	WE7OPEN128

4. Set the WEPkey index which selects which one of the 4 possible WEPkeys will be used. The default WEPkey is WEPkey1—if you intend to use only this one key then only the WEPkey1 value needs to be loaded.

WEPkey Index #	Barcode
WEPkey1 (default)	AW0001
WEPkey2	AW0002
WEPkey3	AW0003
WEPkey4	AW0004

5. Set the WEPkey value according to the encryption mode selected

WEPkey value	Barcode 40 bit key (10 hex digits)	Barcode 128 bit key (26 hex digits)
WEPkey1	WK1h_1…h_{10}	WK1h_1…h_{26}
WEPkey2	WK2h_1…h_{10}	WK2h_1…h_{26}
WEPkey3	WK3h_1…h_{10}	WK3h_1…h_{26}
WEPkey4	WK4h_1…h_{10}	WK4h_1…h_{26}

6. Scan "Save Configuration"—the settings will be saved and the unit will reboot with the new WEP keys installed

WPA

Scanvue5, V6.20 and later versions support WPA and WPA2. The UnitConfig program provides the user interface to setup the various WPA mode(s) for the radio inside the Scanvue5. The supported ScanVue settings are shown in the table below. For additional security requirements contact IEE Sales.

SCANVUE				
WPA			WPA-2	
USEWPA	TRUE		USEWPA	TRUE
WPDSCANSSID	TRUE		WPDSCANSSID	TRUE
WPAKEYMGMNT	WPA-PSK		WPAKEYMGMNT	WPA-PSK
WPAPAIRWISE	TKIP		WPAPAIRWISE	CCMP
WPAGROUP	TKIP		WPAGROUP	CCMP

Chapter 5—Interfacing to the Back Office Server

UPC Code [request] sent from scanner

Scanner

Controller

Display

ScanVue5

A P I

Network

A P I

HOST COMPUTER

- AS400*
- VAX
- WINTEL*

- NT*/2000/98
- Unix*
- Other

*=most popular

Image and/or text returned by HOST

Product Images [Graphics Files]

Product Price & Description [Text File]

Relational Data Base
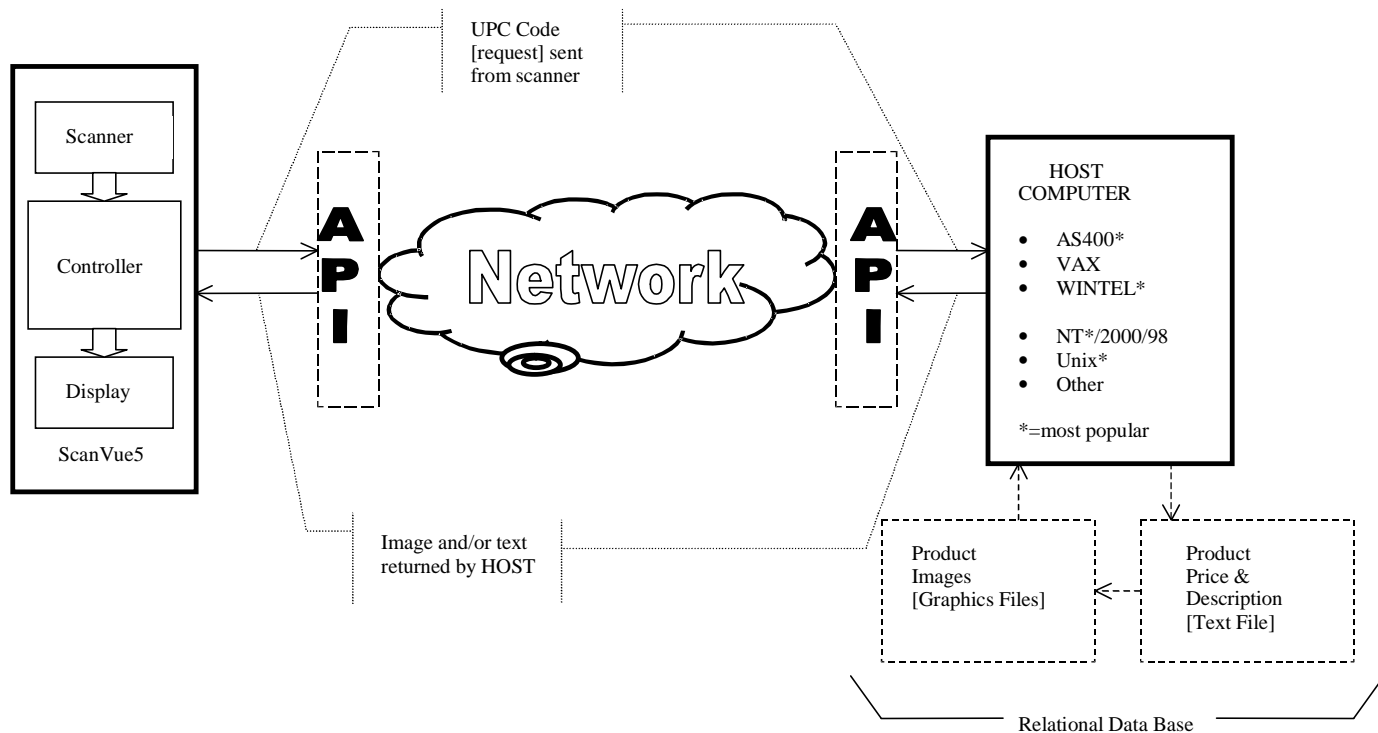
The API (Application Programming Interface) is a description of the ProductInfo protocol that enables the host computer to communicate with ScanVue. It is not a physical piece of hardware. Both ends of the API are physically the same piece of software.

ScanVue only performs 3 functions:

1. Scan the product UPC (barcode) and send it to the HOST computer across the network.
2. Accept the response from the HOST and display the information appropriately
3. Automatically download a slideshow from the HOST and play it.

Figure 14—Simplified ScanVue5® System Diagram

Overview

A generic protocol called 'ProductInfo' has been created especially for interfacing price verifier units such as ScanVue5® with the back office server that holds the database containing item prices and descriptions. Implementations of ProductInfo directed at specific hardware platforms, ScanVue5® in this case, are a subset of the full protocol. This is one part of the API or Application Programming Interface for that specific device. The other part of the API is concerned with configuration, control and setting modes. Both parts are covered in detail in this Chapter.

The application that links ScanVue5® and the back office server's data must reside on the server. Almost any platform that runs a TCP/IP network can be used as a server. Known hardware platforms in use include AS400, VAX and Wintel. Software platforms include Windows NT, UNIX, Linux, and VMS, running Oracle, SQL or other databases.

Software Developers Kit (SDK)

The CD–ROM shipped with ScanVue5® contains the following items:

- *SetupServer.exe* program (IEE logo). Creates the necessary directories on the server and installs all required files and utilities into them.

- *UnitConfig.exe* install program (IEE logo). Installs the unit configuration program into the POS directory on the server. UnitConfig is a GUI program used for setting up ScanVue5® from the network. Written in VisualBasic, the .exe, VB sources and an OCX are provided. When installed the program has a wrench logo.

- User manuals, quickstart guides and other useful documents in Acrobat (.pdf) format.

- Source code for demo servers and some utilities. The sample programs demonstrate communications with ScanVue5® using the ProductInfo and QFX protocols and include ProductInfo and QFX servers. The VB sources and an OCX are provided for the Unit Configuration program so it may be embedded in the host application. All other programs are written in ANSI C and have been compiled and run without modification under NT, linux, UNIX, and VMS. QFX is a faster, lower overhead alternative to FTP and SMB and provides the added benefit of supporting graphic files in any format.

- A number of useful freeware and shareware utilities.

- ScanVue5® requires images in either GIF or FIF (Fast Image Format), ¼ VGA (320x240 pixel) format. We recommend the use of **ImageMagick** for image file conversion from other formats into either GIF or uncompressed form. **ImageMagick** is a collection of tools and libraries for reading writing and manipulating images in 68 standard formats including TIFF, JPEG, PNG, PDF, PhotoCD and GIF. Information on **ImageMagick** can be found at www.imagemagick.org.

ProductInfo Protocol Description

ScanVue5® has an embedded protocol engine that uses TCP/IP to send the UPC barcode number from the price verifier to the host computer, and return the price and description information retrieved from the host computers' database by its resident application.

ProductInfo is a TCP based, bi–directional message–passing protocol that uses the same format when moving data in either direction. In normal operation, the client opens a connection for each request generated, usually a scanned barcode, and keeps it open until the server instructs the client to close it. The client can also wait for the server to open a socket thus allowing asynchronous operation.

An optional non-normal mode provides a permanently open socket so the server can continuously monitor the state of the client.   This mode was created specifically for a customer.

The protocol also sends events marking a change of state (opening or closing) of any of the four optional front panel switches. These events may be used by the hosts resident application to control functions or modes within the application, for instance to change language displayed when a switch is pressed.

An abstract system level diagram showing the relationship between ScanVue5®, the network and the host computer is shown in Figure 14. The API is shown at both ends of the network for clarity. In practice, the application to interface the host computer server to ScanVue5® will reside on the host computer.

In the interest of robustness, both ends accept any message whether defined or not, invalid or unknown messages are simply discarded. **A maximum reasonable message length may be used as a means to detect implementation bugs that could result in loss of synchronization.** Such errors terminate the connection. If the client detects it, it may send an error token following re–establishment of the connection in order to log the error on the server. If the server is able to detect this condition, it can log it directly. When the server receives a product query from the price verifier, it must respond even if the message is just to terminate the connection. Following submitting a query, the client may choose to take an error action if it receives nothing from the server within a defined timeout period. The server can make capability queries and/or mode changes before, during, after, or in lieu of sending any response. **If the server wishes to space messages more widely than the client's default timeout, it must send a 'Set Mode' packet to change the timeout; this need only be done once per query, but must be done on each query.**

The client may send capability messages regardless of whether the **key name** is known to the server and the server may retain this information. When the server needs to know the value of one of these capabilities, it can consult this retained information. If it is not known, a capability query may be sent and the server may wait a moment for a reply to be received. This reply will asynchronously update the server's information, and the value should be found there by a subsequent lookup following the brief interval required for the client to respond to the query. If it remains undefined, it can be assumed that the client declined to respond, probably because that capability name is not known to it.

Mode settings allow the server to select between optional behaviors or parameters in the client. Theoretically, this can work both ways. If the server wants the client to adopt a

certain mode setting, it sends the command and the client will respond appropriately. If not, an error report may be generated in response. Mode settings occupy a separate name–space from the capabilities table. A mode setting could be used to change the timeout value the client uses to decide that a socket connection has broken.

Error reports are used primarily as a debugging tool. The string starts with an error number, optionally followed by white–space and explanatory text.

In the nominal case, messages consist of a length, followed by a token, possibly followed by more information as specified by the length and the token. In the trivial case, the message consists solely as a NUL–terminated text string; this is the case when each of the four bytes of length field is an ASCII printable character. When such a message is received by the server, it is interpreted as a product query; it optionally contains the client's identification and white–space preceding the product code. When received by the client, it is interpreted as a single, textual response to a query.

Tokens		**Data Types**	
Terminate connection	TERM	No Operation	NOP_
Capability query	CAPQ	Display Text	TEXT
Capability	CAPR	Special Text	SPEC
Mode set/query	MDSQ	UNC	UNC_
Mode Response	MODR	URL	URL_
Error Report	ERR_	FIF	FIF_
Product query	PROD		
Data	DATA		
Registration	RGST		
Event	EVNT		

Protocol Implementation Rules

1. Mode values changed during a query session are only retained during that session.

2. The host can make "permanent" changes to mode values for query sessions by connecting to the ProductInfo protocol port (Port 1283) of the client and setting the values. As long as that connection is maintained, the new values will be used in all further queries.

3. Whether a "permanent change" will survive a power cycle of the client is implementation dependent. Clients may provide special functions to record mode information in non–volatile storage.

4. Query sessions are best kept limited to information that is to be displayed immediately, so that further queries can be answered.

5. Mode values that start or end with whitespace must be sent enclosed in double quotes. These quotes are removed when the value is stored. Double quotes within the string are treated as part of the value.

6. When using double-byte font files such as the Kanji font (7640 characters), text strings must be defined as Big-Endian or Little-Endian depending on the server.

ScanVue5® Implementation Rules

1. ScanVue5® maintains an asynchronous ProductInfo server. The host can open a connection and send messages to this listener at any time.

2. ScanVue5® sends carriage return/linefeed pairs to indicate an end–of–line (<NUL> marks end–of–string) to accommodate various host computers, but will accept either or both.

3. When started up, ScanVue5® makes a copy of the setup information stored in the non–volatile memory. Changing a mode's value modifies this copy and is the source of mode values when a mode request is executed. Setting a mode does not preserve the new value in non–volatile memory; the new value(s) must be specifically committed. A second copy of the setup information is kept as the current value set. This copy is modified by the SCANVUE.INI file contents.

4. The values that are read for modes are those default values and may not reflect the current operational values. This will occur when the initialization file overrides the default values. Setting values sets what will be recorded to non–volatile memory, but may not affect immediate operations.

5. Changing a mode's value may not cause ScanVue5® to immediately change its behavior; some changes require the unit be reset before they take effect.

6. The modes that are immediately affected when changed are: Timeout, TrivialComm, SendUnitID, SendError, SendResponse, TextBackgnd, TextForegnd, and QueryPrefix.

7. The text display modes (TextHPos, TextVPos, TextRows, TextCols) can be forced to take effect by setting the TextReset mode to TRUE.

8. The QueryPrefix can contain binary information. To set a QueryPrefix with binary values, use a 'C' language format string for the value. ScanVue5® accepts "\x" followed by two hex digits as a single character with the value of the two hex digits; no other sequences are recognized.

9. When powered up, ScanVue5® will attempt to register with the host system. If it cannot do so, it waits 10 seconds and tries again. After each failure, it waits one second longer than the previous time, ad infinitum. Additionally, whenever ScanVue detects that the initialization file has changed, it will make one attempt to re–register. This allows a host computer that has gone down to force all ScanVue®s to register without knowing which or how many ScanVues® are on the network. Registration can be selectively disabled.

10. Text transfers using the default extended ASCII character set shown in Appendix D should be sent in nominal mode. This is because many libraries do not properly handle the characters outside of the usual ASCII range (32–127) correctly.

ScanVue5® Supported Modes

This section defines the device specific implementation for ScanVue5®

Note: Mode names are case insensitive. Values have case preserved.

Fixed Unit Identification

BuildInfo	The date and time of the software release in the format YYYYMMDDhhmmss; read–only.
ProductName	"ScanVue®"; read–only.
SerialNumber	Contains the unique serial number for the unit; read–only.

User Configurable Unit identification

UnitID	The host name of the unit, 19 characters maximum.
UnitIP	The IP address of the unit, in standard IP dotted notation.
UnitMask	The network mask for the unit, in standard IP dotted notation.
GatewayIP	The IP address of the gateway machine, in standard IP dotted notation. Required only if access to the various hosts must be routed on the LAN.
UserName	The username ScanVue5® uses when logging into the file server.
Password	The password ScanVue5® uses when logging into the file server.

Setup for Windows Networking (SMB)

Domain	Network domain is required when security is a concern.
DNS	Domain Name Server IP Address (if required to resolve network host names)
NetworkName	Name of the wireless network (ESSID). Identifies the network access point for wireless units.
WINSServerIP	The IP address of the WINS server, in standard IP dotted notation, if the file server is not on the local network.
WindowsServ	The host name of the Windows server.
ShareName	The name of the shared directory on the Windows server.

ScanVue5® FTP server configuration

(Note: These modes are only applicable to models using the pSOS+ operating system. Models using the Linux operating system do not have an FTP server)

FTPUserName	The user name for logging into ScanVue5®'s FTP server.
FTPPassword	The password for the FTPUserName.
FTPSuperName	The Super–User name for logging into ScanVue5®'s FTP server (required for updating the software).
FTPSuperPwd	The Super–user's password.

Setup for FTP, QFX, NTP, PRODUCTINFO

ServerType   Sets the file host as Windows networking ("SMB"), FTP ("FTP"), or QFX ("QFX").

FTPServerIP   The IP address of the FTP server in standard IP dotted notation.

QFXPort   The IP port to use for QFX communications.

QFXServer   The IP address of the QFX server.

QFXTimeout   The number of hundredths of a second to wait before timing out on QFX communications.

NTPHost   The IP address of the NTP server to provide the date and time, in standard IP dotted notation. The date obtained is assumed to be GMT.

NTPTZOffset   The number of minutes to offset from GMT for the local time zone.

SloppiHost   The IP address of the PRODUCTINFO server in standard IP dotted notation. Can also be a host name up to 12 characters long.

AlternateSloppiHost

              The IP address of the backup PRODUCTINFO server in standard IP dotted notation. Can also be a host name up to 12 characters long.

              If SloppiHost fails to respond to a scan request in 10 seconds, the host server will automatically switch to the AlternateSloppiHost server and remain there until either the unit reboots or the server is turned off

SloppiPort   The IP port to use when sending product information requests and listening for connections.

SloppiTimeout The maximum wait time, in hundredths of a second, for an initial response to a product information query, kept in non–volatile storage.

Product Query configuration

IgnoreAckNak Sets ScanVue to ignore ACK and NACK characters when received at the beginning of an expected packet. Default is FALSE.

IgnoreResponseChars

              Sets ScanVue to ignore the number of characters specified, from 0–255 at the beginning of the response packet to a query; default=0.

QueryPadTo   Sets the number of text characters for a barcode query to at least the specified number of bytes by adding NUL bytes after the query string. Value is 0 to 64. Default=0. Has no effect if value <= # bytes in barcode+3

QueryPrefix   Up to 198 characters. If set, it is prefixed to all query requests.

SendError   Controls whether error messages are sent in response to unknown messages, mode set commands with improper parameters, etc. The default is FALSE.

SendResponse Controls whether confirmation messages are returned after setting a mode's value.

SendUnitID   Controls whether the UnitID string is sent as part of product information requests. The default is TRUE.

TrivialComm   The protocol method to use for product information queries

Presentation configuration

TextCols	The number of columns of text displayed (in pixels)
TextRows	The number of rows of text displayed (in pixels)
TextHPos	The horizontal offset from the left edge where text starts (in pixels). Must be an integral multiple of four pixels. Space must be available on the right side of the line–characters cannot be pushed off the screen.
TextVPos	The vertical offset from the top edge where text starts (in pixels). Must be an integral multiple of four pixels.
TextBackgnd	The color index for background text.
TextForegnd	The color index for foreground text.
TextDisplay	Set to EXCLUSIVE for a text only display, or MIXED for a text window overlayed on a graphic image.
FontFile	The file name of the current font.
MsgChecking	The string that is displayed by the ScanVue5® when making a product information request. If /filename.gif is used instead of a string, the image filename.gif is displayed rather than the string message. This is known as *wallpaper*
MsgUnavail	The string that is displayed by the ScanVue5® when the product information server does not respond.
POSTimeout	The number of seconds that text will be displayed before it is cleared and the slide show restarted.
ShowShortPoll	The delay, in seconds, before trying to read the INI file, if it has never succeeded; default=60.
ShowLongPoll	The delay, in seconds, before checking for changes in the INI or slideshow file; default=300.
TextTransparent	When set TRUE, the underlying image is visible through the text box background with only the characters being opaque.

Multiple Windows

Showtime	Number of 1/100sec ticks an image is displayed when using multiple graphic windows. Use in conjunction with the DelayNextImage and @ x,y modes.
DelayNextImage	Number of 1/100sec ticks before the next image is displayed
@x,y	Top left position of the window in pixels

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Real Time Clock Display

ClockFontFile   The filename and path of the font file for the clock display. A different font than the text display may be used.

ClockHPos   Leftmost (horizontal) position of the clock display in pixels. Top left corner of display screen is 0,0, bottom right corner is 319,219

ClockVPos   Topmost (vertical) position of the clock display in pixels. Specifying ClockHPos,ClockVPos defines the top left corner of the clock display.

Clock_Fcolor   Foreground color of clock display (0-255)

Clock_Bcolor   Background color of clock display (0-255).

ClockFormat   =0; 12 hour display, no AM/PM; =12; 12 hour display with AM/PM

ClockUpdateInterval

    =1; displays hh:mm:ss; =60; displays hh:mm

    =24; 24 hour display.

ScanShowClock

    Turns off clock during a scan, or forces it to remain on at all times.
    TRUE=display clock at all times, FALSE=turn of clock during a scan

ClockTransparent

    When set TRUE, the underlying image is visible through the text background with only the clock characters being opaque. If set FALSE the clock is displayed in a box who's color is defined by Clock_Bcolor.

Miscellaneous configuration

DateTime   The current date and time in the format YYYYMMDDhhmmss. This will be correct only if the host has set this value, or if NTPHost is set and ScanVue5® is able to obtain the correct time from the NTP server.

EventEnd   An 8 character string of hex digits (32 bit mask) which enables ending events for a specific device as defined in the table below.

EventStart   An 8 character string of hex digits (32 bit mask) which enables starting events for a specific device as defined in the table below.

Mode	Value (mask setting)
Disable mask	00000000_h
Pushbutton 0 (leftmost)	00000001_h
Pushbutton 1 (2nd from left)	00000002_h
Pushbutton 2 (3rd from left)	00000004_h
Pushbutton 3 (rightmost)	00000008_h
Touch panel pressed	00000010_h
Key pressed	00000020_h

Start and end masks are both present in a transmitted packet but one is always disabled. An input device using both start and stop events will generate two complete packets, one for start and one for stop. For most applications the end mask is not required and should be disabled. Examples and a full explanation of Event mask usage is in the *Using Input Devices* section on p.42.

WallPaperEvent An 8 character string of hex digits representing a bit map which enable event messages (e.g., button pushes) to be sent only during the time wallpaper is displayed (usually after an item is scanned)

Button Position	Left	2nd from Left	3rd from left	Right
Label	Event0	Event1	Event2	Event3
Value(h)	00000001	00000002	00000004	00000008

The default value 00000000(h) allows all 4 events to operate at all times and 0000000F(h) only when wallpaper is active.

User1   A string up to 255 characters long that can be set and read by the application.

RegisterINI   ScanVue5® will register itself with the ProductInfo host after successfully reading a new INI file.

RegisterStart ScanVue5® will register with the ProductInfo host upon startup.

DisplaySetup Display the first information screen at startup.

DisplaySetup2 Display the second information screen at startup

DisplayAll   Display passwords on the information screens

NoBarCodes   Disable configuration by barcode mode

Version	Returns a string containing the software version number
Diversity	Enable diversity antennas. 'ENABLED'; 'PRIMARY'; 'SECONDARY'. Use primary or secondary only as ScanVue5® has only one antenna. The default is primary and the antenna is connected to the primary input on the RF NIC card.
Wireless	'TRUE' sets ScanVue communications to wireless RF. 'FALSE' sets communications to 10baseT Ethernet.
FlashHash	A CRC calculated on the content of flash memory. The CRC is displayed on the initial bootup status screen. Display format is CCCC–TTTT where the 1st four hex digits are the calculated CRC and the 2nd four hex digits are the received CRC from the host. Both CRC's must match to ensure no file corruption during download. There is no error correcting mechanism at this time. Also displays in UnitConfig.
Port2Function	Changes the function of the external RS232 port. Port parameters are fixed for each device (Value). The port passes data transparently in both directions. The port function can be changed with modeset or the UnitConfig utility. Factory default is scanner mode.

Value	Function
SCANNER	Receives data from hand scanner (input port)
OUTPUT	Passes through data sent by server (output port)
BIDIRECTIONAL	Operates in both directions
KEYPAD	20 key keypad

Port2Input	Defines whether Scanvue sends a character at a time or a complete line to server. Default value=CHARACTER

Value	Function
LINE	Buffers all characters until CR or LF received then sends entire string to host.
CHARACTER	Sends each character as received to host. Typically used with NCR K590 printer

Port3Function	Changes the function of the second external RS232 port #3. *This physical port does not exist on later (LX800) ScanVues, but the settings are used for the USB Magnetic Stripe Reader.* Port parameters are fixed for each device (Value). The port passes data transparently in both directions. The port function can be changed with modeset or the UnitConfig utility.

Value	Function
OUTPUT	Passes through data sent by server (output port)
KEYBOARD	Keyboard input
TOUCHSCREEN	Enables Touch Screen input
BIDIRECTIONAL	Operates in both directions
MSR	*Magnetic Stripe Reader input*
NONE	Disabled

Port3Input   Defines whether Scanvue sends a character at a time or a complete line to server. Default value=CHARACTER

Value	Function
LINE	Buffers all characters until CR or LF received then sends entire string to host. Typically used with MSR
CHARACTER	Sends each character as received to host. Typically used with NCR K590 printer

BypassNCRPrefix

Instructs Scanvue to accept NCR prefixed bar codes for programming. Default value = TRUE. NCR prefix mode does not have to be turned off to be able to program the unit with barcodes.

ExtCharacterSet

Applicable only to ScanVue420 VF (Century) display models. Selects a character set (language) for display. The default character set contains 'European' in 64 positions AO-DF. The extended language character sets are shown in Appendix D.

Character Set	Value
ASCII+European	EUROPEAN (default)
ASCII+Katakana	KATAKANA
ASCII+Cyrillic	CYRILLIC
ASCII+Hebrew	HEBREW

PointerHScale Sets the touchscreen horizontal resolution to any integer value between 1 and 16

PointerVScale Sets the touchscreen vertical resolution to any integer value between 1 and 12

KeepAliveTime When set to 0, the unit will operate in its normal mode: that is, it will close the socket on port 1283 when the transaction is complete. If any non-zero value is entered, the socket is kept open by "keep alives" sent at the frequency based on the value set in seconds. Note: KeepAliveTime must be reset to 0 to connect to UnitConfig

Command modes

Commit   Set TRUE, causes the mode settings received to be written in internal flash memory and become the defaults for future operation. FALSE indicates that some settings have been changed but not recorded.

Invalidate Sets all mode values to factory defaults and restarts the unit.

Restart   Set TRUE, causes the unit to restart. This must be done after a commit to use the new settings.

TextReset Set TRUE, causes the setting for displayed text to be immediately enforced. FALSE indicates that some settings have changed. For the

text values to become permanent, the commit command must also be issued.

Programmatic Modes

Programmatic modes are for use within another program and cannot be read or set interactively with UnitConfig or modeset. For example, UnitStatus is a mode used within the 'heartbeat' utility program to report on the status of the unit being read. These modes may also be used within your own program.

GiveHelpText   Appends help text to null MDSQ requests.

Timeout   The maximum wait time, in hundredths of a second, for an initial response to a product information query. Valid for the current connection only.

UnitStatus   Reports on the state and activity of the unit. Returns a single line of values separated by spaces. Counters restart from zero if maximum count exceeded or unit is reset. In order the values are:

Number of seconds unit has been running since last reset. Largest number is 42949672 (~16 months).

A single character indicates the current state of the slideshow. N=no slideshow loaded; R=slideshow running; L=slideshow being loaded.

Total number of slideshows that have been successfully loaded and started. Maximum count 65535.

Number of slides defined in current slideshow script. Maximum number 65535. If not running, it is the number in previous show or the current show that was not able to load slides.

Number of slides successfully loaded. If the show is running this is the actual number of running slides. If not running, it is the number for the previous show or the current show that was not able to load slides. e.g., 160 slides defined, 147 loaded.

Total number of slides displayed since last reset. Maximum value is 4294967295.

Total number of images displayed since last reset. Maximum value is 4294967295 and includes text messages, start up screen, frames from pushed animations…

Number of barcodes scanned since startup. Maximum value is 4294967295 and excludes barcodes scanned while the unit is busy with another product request.

Number of responses from the host to product info queries. Maximum value is 4294967295. Includes both positive and negative responses.

Number of times the unit received no response from the server. Maximum value is 4294967295.

QFX Quick File Transfer Protocol

QFX is a very low overhead protocol that is a much simpler and faster alternative to FTP for moving files quickly across the network. There is no authentication. The QFX server allows only read access to files in and below its default directory; this is the extent of security.

QFX packets consist of a 4–byte (network order) packet length, a 4–character token, and possibly data. Packet length includes the 4–byte length field.

Tokens are:

INFO   File information request/response
SEND   File send request/response
DIFF   File timestamp comparison
ERRR   Error response

INFO exchange:

    request: [length][INFO][filespec <NUL>]

    response: [length][INFO][YYYYMMDDhhmmss size <NUL>]
                       Four digits for year, two each for month (January is 01), day (01–31), hour (00–23), minute (00–59), and second (00–59), followed by a single space–character, and finally the size of the file, in bytes.

    response: [length][ERRR]
                       Requested file does not exist or request is malformed. Explanatory message is optional, should be string consisting of number, whitespace, optional text.

    request: [length][SEND][filespec <NUL>]

    response: [length][SEND][file data]

    response: [length][ERRR]
                       Requested file does not exist or request is malformed. Explanatory message is optional, should be string consisting of number, whitespace, optional text.

request: [length][DIFF][filespec <NUL>][YYYYMMDDhhmmss<NUL>]

response: [length][DIFF][Bool]
                Bool value is TRUE if the file's date/time are DIFFERENT than the
                provided timestamp and FALSE if it is the same.

response: [length][ERRR]
                Requested file does not exist or request is malformed.
                Explanatory message is optional, should be string consisting of
                number, whitespace, optional text.

[filespec] uses UNIX style forward–slash directory notation. It is the responsibility of the server to convert the notation to the native method, and to guarantee that the path cannot extend outside of the default directory.

The directory '/' refers to the current directory; a leading '/' is ignored. The QFX server must guarantee the requested file is in or below its current directory.

Line–terminators are newline characters; carriage returns are optional.

The server is responsible to read text files and transmit them with appropriate line breaks. Specifically, this applies to VAX/VMS.

Using Graphics Characters

ScanVue5® with an AMLCD can display graphics characters such as Kanji and Chinese (ideograms) as well as standard Latin text characters. The graphics font file is downloaded into the price verifier at boot up time by a command line in the scanvue.ini file. As only one font file can be stored at a time, the characters displayed are limited to those in the currently loaded font set. Certain font files contain other characters; for example the Kanji font set also contains English, Greek and Cyrillic characters and GB (simplified) Chinese includes 128 US-ASCII characters. Note: although standard US-ASCII characters are single byte coded, using the US-ASCII characters in the GB Chinese font file requires the double byte codes specified in that font file.

Displaying graphics characters requires two hex bytes (double-byte text) per character due to the large number of glyphs in the font set (Kanji has 7,640 characters). The rules for using double byte text are shown here.

Double byte text strings come in two types, Big-Endian and Little-Endian. The server hardware determines if you will need big endian or little endian strings. Double byte strings sent in trivial mode must be double NUL (00 00) terminated whereas strings sent in nominal mode do not have to be.

Big-Endian text strings start with the bytes FE FF and end with the bytes 00 00.
    Ex: **FE FF** b_1 b_2 b_3 b_4 b_5 b_6 b_7 b_8 b_9 b_{10}..........**00 00**

Little-Endian text strings start with the bytes FF FE and end with the bytes 00 00
    Ex: **FF FE** b_1 b_2 b_3 b_4 b_5 b_6 b_7 b_8 b_9 b_{10}..........**00 00**
        where b_1-b_{10} are a string of 5 double-byte character codes.

In scanvue.ini, double byte strings can be used for wallpaper but the text must start with << instead of < or // instead of /.

For the Demoserve data file (data.dat) on the CD-ROM, the characters |> indicate a Big-Endian string and |< indicates a Little-Endian string. Note: Demoserve actually sends the FE FF or FF FE bytes not |> or |<.

A utility program, dmp2gdf, provided on the CD-ROM creates a .gdf (double-byte) font file from a single byte ASCII font file.

Using Input Devices

Scanvue5 has four optional types of manual input device in addition to the standard barcode scanner.   Each type of manual input device generates message tokens with a similar message packet structure called EVENTS and thus they are all treated together in this section.

Activating any of the input devices—barcode scanner, touch screen, keypad, magnetic stripe reader or push button, causes Scanvue5 to transmit the input data, usually a string of alphanumeric characters, to the host computer for further action by the server based application.

Touch Screen
The digital touch panel is organized in a 16 column x 12 row matrix. The LCD screen resolution is 320 x 240 pixels (¼ VGA). Thus each of the 192 discrete touch areas formed by the matrix is a 20 x 20 pixel square, which is dimensionally ¼"x ¼" and defines the maximum resolution of the touch screen. Resolution scaling (increasing the dimensional size of the discrete touch areas) may be set for each axis independently down to 1 column x 1 row—in other words where the whole display screen is a single touch button. Resolution scaling can also be changed dynamically by the users application.   In fact, the internal resolution is changed to be 2:1 for increased sensitivity.

__reported position={measured position x vertical (or horiz.) scale}/max. resolution__
rounded to the next highest integer.

Factory default setting is at the touch screens highest resolution of 31 x 23 where the top left corner co-ordinate is y,x = 0,0 and the bottom right corner co-ordinate y,x = 23,31.

Examples of calculations for a 4 x 4 matrix—although this is done internally and the user will only see the reported position.

	@4,4 pos. 1	@4,4 pos. 2	@3,3 pos. 3	@3,3 pos. 4	@2,2 pos. 5	@2,2 pos. 6
x	h=(31x4)/31 = 4	h=(25x4)/31 =3.23 ~ 4	h=(23x4)/31 =2.97 ~3	h=(17x4)/31 =2.19 ~ 3	h=(15x4)/31 h=1.94 ~ 2	h=(9x4)/31 h=1.16 ~ 2
y	v=(23x4)/23 = 4	v=(19x4)/23 =3.31 ~ 4	v=(17x4)/23 =2.96 ~ 3	v=(13x4)/23 =2.26 ~ 3	v=(11x4)/23 =1.91 ~ 2	v=(7x4)/23 =1.57 ~ 2

	0	7	15	23	31
0					
5	1,1	1,2	1,3	1,4	
	2,1	6 2,2	2,3	2,4	
11		5	4		
	3,1	3,2	3,3	3,4	
17			3		
	4,1	4,2	4,3	2 4,4	
23				1	

Touching the panel anywhere within a specific 20 x 20 pixel area or resolution scaled area will stuff the start mask and y,x co-ordinates of that touch area and the number of 10 millisec clock ticks since the last event into the EVNT packet and transmit it to the host computer application.

Keypad

A 20 key keypad mounted on the right side of the Scanvue5 unit. When a key is pressed, its ASCII code will be stuffed into the EVNT packet and transmitted to the host computer. Each key pressed will generated a separate EVNT packet.

Push Buttons

Four mechanical push button switches located on the front bezel directly under the LCD screen. The buttons are strategically placed so the bottom edge of the display screen may be used for 'soft' legends allowing the application to navigate through multiple menu levels. *This option is mutually exclusive with the touch screen.*

Magnetic Stripe Reader

A three track swipe reader that reads data from any standard ISO 7811, ANSI , AAMVA or California DMV encoded magnetic stripe credit, loyalty or gift card.   Decoded ASCII characters read from the 3 tracks are stuffed into an EVNT packet and transmitted to the host computer. Raw card data is not encrypted before transmitting it to the host. The data is transmitted as a serial stream as follows:

<S1> <DATA1> <ES> <S2> <DATA2> <ES> <S3> <DATA3> <ES>
where S1, S2, S3 are the start sentinels for track1, track2 and track3 and ES is the end sentinel for all tracks.

Sentinels	S1	S2	S3	ES	<DataN>
ISO format	%	;	+	?	ASCII
CADMV format	%	;	!	?	ASCII
Invalid track					E

If the track data is not valid <DataN> will be character E.   The status LED is normally off, lights green for a good read or red for ½ sec, then green for a bad read.

Configuring Scanvue5 for Input Devices

A multiplexer (MUX) PCB is installed in Scanvue5 units that have a touch screen or magnetic stripe input device. Pushbuttons do not require the MUX PCB however they cannot be used when the MUX is installed. The keypad may be run from the external serial port without using a MUX however this precludes using a printer on this port. Scanvue5 must be running version 5.02 or later to support any of the input devices.

Enable Multiplexer

The multiplexer PCB must be enabled to operate with input devices in versions 5.02 and earlier. In versions later than 5.02, the multiplexer is detected and enabled automatically and this mode will not show up in UnitConfig.
  ▪ Set MUX ENABLED to TRUE

Start Event and End Event Masks

Start and end event masks define the beginning and completion of a device activation period. For instance, a pushbutton start mask defines when the button is pressed and the end mask defines when it is released. The mode values are 8 digit hex masks (32 bit) which define the type of device initiating the event as well as the button position (see Table 1). Start and end masks are always present in the transmitted packet when the device is used but for most applications the end event mask should be disabled by setting it to 0 in UnitConfig. Set the mode values (mask settings) as shown in Table 1

Push Buttons

The time the button is pressed and held down can be measured by setting the start and end event masks and reading the number of 10 millisec clock ticks between them. For example, this could be useful in an application to discriminate between a 'short' press and a 'long' press.
  ▪ Set start mask. Set end mask only if required for timing

Touch Screen

The touch screen has only start events, however 2 or more touch areas pressed simultaneously will be recorded and transmitted in the same packet. The clock tick count in this case is the time elapsed from the prior event.
  ▪ Set start mask only.

Keypad

The keypad end event is sent immediately after the start event—this is done to lock out the 'repeat key' feature built in to commercial keyboard decoder chips. The clock tick count is the time elapsed from the prior event.

- ▪ Set start mask only (end mask is stuffed automatically)

Mode (Description)	Value (Mask Setting)
Disable mask (factory default)	00000000_h
Push button 0 (leftmost)	00000001_h
Push button 0 (2nd from left)	00000002_h
Push button 0 (3rd from left)	00000004_h
Push button 0 (rightmost)	00000008_h
Touch panel pressed	00000010_h
Keypad pressed/released	00000020_h

Table 1

Data Bytes (Parameters)

Each transmitted event packet contains three 8 hex digit words. Pressing the touch screen or a key on the keypad will cause the appropriate data to be stuffed into the parameter words as shown in the Table 2. Push buttons do not set values in the data bytes.

Mode (Description)	Value (Setting)
Touch Screen	
Parameter 0	00000010_h
Parameter 1	scaled y co-ordinate (1-16)
Parameter 2	scaled x co-ordinate (1-12)
Keypad	
Parameter 0	ASCII keycode
Parameter 1	00000000_h (not used)
Parameter 2	00000000_h (not used)

Table 2

Structure of EVENT packet

1. The EVENT packet format for push buttons is described in the Scanvue User Manual ProductInfo section but is repeated here for completeness.
2. EVENT packets report push button, touch screen and keypad activations but each device type will send a separate EVENT packet.
3. Separate packets are sent for start events and end events (if used).
4. Push button events do not generate data (only whether they are pressed or not pressed) and thus do not set the parameter values.
5. Pressing the touch screen transmits a (minimum) 33 byte message packet to the host computer in the following general format.

   [length+EVNT]+[24 data bytes]+[unit ID]+[0]

where

length=4 bytes whose value is the number of bytes in the message including the length byte

EVNT=4 byte character string token

24 data bytes consisting of:

      32 bit mask of events started (4 bytes)

      32 bit mask of events ended (4 bytes)

      32 bit unsigned count of the number of 10 millisecond clock ticks since last event (4 bytes)

      32 bit parameter 0 data word (4 bytes)

      32 bit parameter 1 data word (4 bytes)

      32 bit parameter 2 data word (4 bytes)

variable length character string containing unit ID (if mode enabled in UnitConfig)

0= message terminator containing 0 zero value (1 byte).

Examples (shown in hex form)

Touch screen start event packet for bottom right corner press (11,15)

[00000028 45564E54 00000010 00000000 000001F4 00000010 0000000B 0000000F 5343414E565545 00]_h

| | | | | | | | | |
length   EVNT   start mask stop mask tick count   touch   y co-ord   x co-ord   SCANVUE   terminator
for touch   500 mS   11   15

Keypad start event packet for 9 key press

[00000028 45564E54 00000020 00000000 000001F4 00000039 00000000 00000000 5343414E565545 00]_h

| | | | | | | | |
length   EVNT   start mask stop mask tick count   keycode   not used   not used   SCANVUE   terminator
for keypad   500 mS   9 key pressed

Push button start event packet for button 2 (no unit ID)

[00000021 45564E54 00000004 00000000 00000000 00000000 00000000 00000000 00]_h

| | | | | | | | |
length   EVNT   start mask stop mask tick count   not used   not used   not used   terminator
for button 2

Pushbutton end event packet for button 2, 500mS button press, (no unit ID)

[00000021 45564E54 00000000 00000004 000001F4 00000000 00000000 00000000 00]_h

| | | | | | | | |
length   EVNT   start mask stop mask tick count   not used   not used   not used   terminator
for button 2 500 mS

ScanVue420 Vacuum Fluorescent Display

Note: references in this manual to the use of graphics images, double-byte text and downloaded fonts are not applicable to the Scanvue420 model.

Description
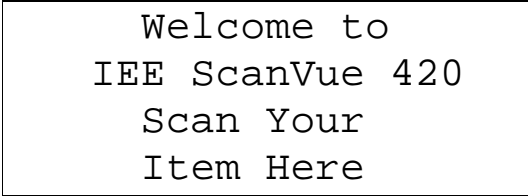
ScanVue420 has a 4 line x 20 character x 5mm high, 5x7 dot matrix vacuum fluorescent (VF) display and shows text in a fixed font size and pitch. The default character set is US-ASCII extended with 64 European characters. There are three (3) more 64 character extended language sets Cyrillic, Hebrew and Katakana that can be selected from the UnitConfig program by entering the character set name in the mode **ExtCharacterSet**. This feature allows the end user to set the character set to the language of choice. Once ScanVue420 is set to display one of these optional character sets, any message sent to the display will use the characters in that chosen language set. The language character sets are shown in Appendix D and always contains the US-ASCII characters shown in Table 4 plus one of the optional 64 character sets shown in Tables 5-8.

The user may change any or all of the 3 internal customer messages (factory default is English) into one of the 4 language character sets available on the VF display. This will allow the user to display customer messages in the language of the country the unit is installed in.

As this model cannot show graphics or inherently run a slideshow, the customer greeting screen shown in Figure 15 is normally displayed as a static screen. It is possible to create a loop of linked text messages on the server side that can be sent to ScanVue420 in a timed sequence to create a 'text slideshow'.

Operation

When ScanVue420 finishes booting up it will display the info status screens first, then the logo screen and finally the static greeting screen shown in Figure 15. This screen will be continuously displayed until either an item is scanned or the host server sends a different message.

```
       Welcome to
    IEE ScanVue 420
       Scan Your
       Item Here
```

Figure 15—Greeting Screen

When a barcoded item is read by the scanner, ScanVue® sends the ASCII characters to the server using the protocols described in Chapter 4 and 5. The mode SendUnitID will transmit the units ID as well as the ASCII characters when set TRUE (default). If the VF unit is mixed with LCD units in the same installation, it is important to keep this mode set

true so the server application can discriminate between VF and LCD unit requests and not send graphics images to VF units. A VF unit receiving an image will display the default no response message then will display a blank screen. The host server should respond to a VF unit with a formatted text information block (TIB) of all 80 characters, including the blanks, to locate the actual text in the required positions on the lines (Figure 16)—there are no direct text formatting commands in the present version.

```
Vintners Merlot Wine
1/5 Gallon    $11.49
   ON SALE TODAY
              $8.99
```

Figure 16—Item Description & Price Display

Text Slideshow

If you want to send multiple messages in sequence, this must be controlled from the host server end. For instance, a text based series of messages for continuous advertising could be sent to the display under control of the host. The host would have to have the sequence of messages in a message file (or multiple small files) and send them in a sequential loop with a delay for adequate viewing time. The loop control would require an interrupt when the host receives data from the ScanVue420 barcode reader to stop the message sequence, retrieve the item description and price, display it for a set time and then return to the message loop.

Changing Language Character Sets

Appendix D shows the VF displays' default ASCII font set with 64 empty character codes between A0 and DF and the four extended language character sets that can fill these empty positions.   Initially, the default character set is US-ASCII+European. The ASCII characters are always available but the extended character set can be changed from UnitConfig by selecting the mode ExtCharacterSet and entering the appropriate value in the New Content box. Only one extended language at a time can be loaded.

Extended Language	Value
ASCII+European	EUROPEAN (default)
ASCII+Katakana	KATAKANA
ASCII+Cyrillic	CYRILLIC
ASCII+Hebrew	HEBREW

Customer Messages

Three (3) internally generated customer messages are built into ScanVue420. These messages give specific information to the customer while using the price verifier. Text content and language can be changed for use in other countries. The messages are:

Checking…...One moment please   Message displayed when an item has been scanned and there is a delay in returning the price and description—usually due to heavy network traffic.

Unavailable…..please try later   Message displayed if ScanVue420 times-out before the server returns price and description or an error message—usually means the network is down.

Welcome to IEE ScanVue420….Scan your item here   Greeting screen (see Fig 15). This is the static 'greeting screen' that is displayed to a customer.

Changing Messages

1. Change the ScanVue420 character set to the one you want to use from UnitConfig. Make all the changes before restarting.   The default character set is US-ASCII+European.

2. When creating new messages, standard characters (that is, those available on your computer keyboard) can be entered directly from the keyboard. Non-standard characters must be entered in hex code form. Hex codes consist of 4 hex digits (\xdd; where \x specifies that a hex code follows, and dd is the hex code for the character you want as shown the character code table) but occupy only 1 character space on the display. See examples in Appendix H–Applications Notes.

3. **Checking…** and **Unavailable…** and **Welcome to IEE…** messages can be changed by entering the new text in the *msgChecking* or *msgUnavailable* or *BannerText* rows in the UnitConfig program screen. Non-standard ASCII characters must be entered as hex codes as described above.

4. After changing these messages, click the **Set Mode**, **Commit** and **Reboot** buttons in sequence. The unit will reboot and the new messages will be saved and active.

The text file string in *BannerText* to create the default message is shown below. In this example \ is used to define the start and end of the text string and * to denote a space. The example is only shown this way to make it clear, and is not required when you create an actual message—however the blank spaces to get the correct alignment are required.

*****Welcome*to*******IEE*ScanVue*420********Scan*Your**********Item*Here*****\

```
←——— line 1 ———→ ↑ ←——— line 2 ———→ ↑ ←——— line 3 ———→ ↑ ←——— line 4 ——→
```

There is a real example of changing messages and language in the Application Notes section (Appendix H).

Appendix A—Configuring with Barcodes

Barcode Reader Settings

Note: the barcode reader is shipped with setting changes "locked out" and cannot be re-configured in the field. This is done at the factory because barcode readers have been maliciously changed by customers in the field. If you need to change the barcode reader settings, reboot the unit and scan any new configuration barcode(s), the first one which has to be within the _**first 60 seconds of the boot cycle**_. Do not wait for the unit to finish booting—it will be too late. This will "unlock" the scanner temporarily and allow you make any required changes. After re-booting, the scanner will be locked again with the new configuration mode set.

To set the scanner to its permanently "unlocked" mode, re-boot the unit and scan the "recall defaults" barcode within 60 seconds. The scanner will then accept any setting changes at anytime.

Units shipped after 3Q2006 use the Metrologic IS3480 scanner rather than the model IS6520. The IS3480 is a physically more compact scanner but otherwise will function identically to the IS6520. The default settings of the barcode reader can easily be changed by directly scanning the specific barcodes shown in the MetroSelect™ Configuration Guide. Download a copy of the Guide (document # MLPN2407.pdf) found under Omniquest™ model # IS6520 or the xxxxxxxxx IS3480 Guide on the Metrologic™ web site at www.metrologic.com/proguide.htm. The Guide provides all the information for making configuration changes to the scanner.

Recommended Scanner Settings

Density	7.59 CPI
Height	0.5 inch
Ratio	3:1
Compute Check Character:	enabled
Print Check Character:	enabled
Print Start and Stop Characters:	enabled
Serial Port Settings	7–bits, odd parity (default for Metrologic scanner)

Lower case requires twice the width of upper case.

Barcodes printed on a laser printer using the recommended settings are generally easily read. The Metrologic scanner sometimes has difficulty reading barcodes that are very wide. Wide barcodes must be held completely flat to be read properly. If your setup information does not contain lower case characters, the density can be relaxed.

Configuring ScanVue5®

ScanVue5® can also be configured for the network by scanning barcodes with its barcode scanner instead of sending the commands over the network. It is preferable to have a copy of the full Metrologic™ Configuration Guide, but at the very least you will

need a hard copy of pages v[p6] (Recall Defaults), A4[p11] (Code 39), and E9[p76] (NCR Prefix ID) of the Configuration Guide.

Create barcode labels in Code128 containing the network information as shown in Table 2 on pages 58 & 59. A program such as **'Avery Label Pro'** or **'B–Coder Lite'** from Taltech can create these for you. **'B–Coder Pro'** can also print the barcodes required to configure the scanner.

Follow the step–by–step procedure outlined in the following pages to configure ScanVue5® using barcodes:

1. Power up the ScanVue5® unit. Wait until it finishes booting, the 2 blue status screens have been displayed and the IEE logo clears. If you have an RF unit, a red connection diagnostic screen may appear if the unit doesn't connect to your network. Either way, you are ready to reconfigure.

2. Scan the following label.
    - **Recall Defaults**

    Each label will generate a single beep when scanned properly, then a double beep to acknowledge the operation is complete.

3. Scan the specific labels (listed in Table 1) required to change the configuration to your network's parameters. Each setup label will beep once when scanned correctly. ScanVue5® will display the raw code, then the setup name and entered value. Frequently used bar codes are provided as a .PDF file on the CD–ROM and may be printed and used directly from the page.

4. When all the setup labels have been scanned in and visually verified, scan the **Save Configuration** label. This causes the complete configuration setup to be written to ScanVue5® non–volatile memory and reboot so the changes will take effect.

5. At this point, use the MetroSelect™ Configuration Guide to scan in the configuration for the barcode scanner. Recommended settings are shown on page 31. The most common configuration requires scanning the **Enable NCR Prefix ID** code. This prevents any legitimate UPC barcode from being read as a configuration barcode.

6. If you need to enter WEP keys by barcode, refer to pages 22 and 23 for specific instruction on how to do this.

7. This completes the network configuration for ScanVue5®. If your network servers have already been set up, ScanVue5® will start communication with the network normally.

Mode/Setting	Barcode	Description	Default Setting
Unit ID	**IDL**SS………S	A unique unit name, 19 characters maximum.	SCANVUE5®
Unit IP[1,4]	**UI**AAAAAAAA	IP Address. Each unit must have a unique	10.0.0.227 or DHCP
Network Mask[1,4]	**UM**AAAAAAAA	IP Sub–net mask	255.255.0.0 or DHCP
Windows Server[2,7]	**WSL**SS……..S	Host name of the file server, 83 characters max.	SVSERVE
Shared Directory[2]	**SDL**SS……...S	Share name on the file server, 83 characters max.	POS
File Server IP[1,7]	**SF**AAAAAAAA	IP Address of the FTP–based file server.	Not Set
Network User Name[2]	**WUL**SS……..S	Used to connect to the file server, 19 characters	GUEST
Network Password[2]	**WPL**SS……..S	Used to connect to the file server, 31 characters	Not Set
Network Name[2]	**NNL**SS………S	ESS ID–network name for wireless networks	INSTALL
DNS IP[1]	**DN**AAAAAAAA	IP Address of DNS	Not Set
Gateway IP[1]	**GW**AAAAAAAA	IP Address for routed or segmented networks.	Not Set
WINS Server IP[1]	**WW**AAAAAAAA	Required for Windows networking.	Not Set
Domain/Workgroup[2]	**DWL**SS………S	Domain or workgroup name, 83 characters max.	IEE
Product Info IP[1]	**DS**AAAAAAAA	IP address of users ProductInfo server.	10.0.10.13
Product Info Port[3]	**DP**nnnn	Port number for ProductInfo.	1283
Product Info Timeout[3]	**TO**nnnn	Duration (secs) product information is shown	30
Wireless RF[3]	**WN**0001	Selects wireless RF mode	Wireless=T, otherwise=F
10baseT Ethernet[3]	**WN**0000	Selects hard wired Ethernet	Hardwired=T,
Diversity Antenna[3]	**SA**0000	Sets RF card diversity antenna mode	FALSE
Primary Antenna[3]	**SA**0001	Sets RF card primary antenna	TRUE

Mode/Setting	Barcode	Description	Default Setting
Secondary Antenna[3]	**SA**0002	Sets RF card secondary antenna	FALSE
Save Configuration	**KQ**0000	Save configuration in EEPROM.BIN file & reboot.	N/A
Backup Configuration	**CFGSAVE**	Create backup of EEPROM.BIN file	N/A
Restore Configuration	**CFGREST**	Restore backup to EEPROM.BIN file	N/A
Factory defaults	**IN**123456789	Scan twice; restores factory default configuration	N/A
Reboot unit	**IN**987654321	Scan twice; reboot without saving config	N/A
Scanner defaults	User Manual	Sets Metrologic scanner to its default settings	N/A
Show config screen 1	**IS**0001	Displays 1st config status screen	N/A
Show config screen 2	**IS**0002	Displays 2nd config status screen	N/A
Show wireless stats	**IS**0003	Displays channel, signal strength & noise stats.	N/A
WEPkey Index	**WA**000N	Enables 1 of 4 WEP keys, where N=1-4	WEPkey1
WEPkey Value	**WKN**h_1.....h_{26}	Where N=Index 1-4 and h=hex digit (4 bits)	h_1....h_{26} all 0's
WEP encryption off	**WE4NONE**	Disables WEP encryption	TRUE
Open System 40	**WE6OPEN40**	Open System 40 bit WEP encryption	FALSE
Open System 128	**WE7OPEN128**	Open System 128 bit WEP encryption	FALSE
Shared System 40[8]	**WE8SHARED40**	Shared System 40 bit WEP encryption	FALSE
Shared System 128[9]	**WE9SHARED128**	Shared System 128 bit WEP encryption	FALSE
Multiplexer Disable	**MX**0000	Disables the internal serial 3 input multiplexer	TRUE
Multiplexer Enable	**MX**0001	Enables the internal serial 3 input multiplexer	FALSE
Reboot Immediate	**RS**0000	Immediately reboots unit	N/A

Table 2—Barcode Configuration Labels

[1] IP addresses ('XXXXXXXX') are in hexl notation. Each of the quads in the address becomes a pair of hex digits (e.g., 10.0.0.10 is encoded as 0A00000A).

[2] String values start with the count of characters ('L') followed by the characters of the string ('SSSSSSS'). ScanVue5® preserves the case of characters in strings even if it is not meaningful to the network or host. The length field is always 2 digits i.e., 3 must be 03.

[3] Numerical values ('L' and 'NNNQ') are decimal. Numerical values must be followed by a non–digit character. Purely numerical parameters (e.g., Product Info Port) should be followed by an upper–case alpha character to prevent confusion caused by check–characters and stop codes.

[4] If shipped as a hardwired unit it has the default IP address shown. If shipped as an RF wireless unit the default is DHCP.

[5] The barcode is shown in the Metrologic user manual

[6] There are 2 different screens depending on the type of RF radio card installed.

[7] Setting the Host name also sets SMB file–access mode. Setting the File Server IP also sets FTP file–access modes.
[8] Not available
[9] Not available

Command barcodes must be at least six characters long, including the two–character prefix but excluding the check character and any start and stop characters. Extra padding characters may be added to guarantee this. Padding characters should be upper case alpha characters and are ignored. Numerical values may be zero padded (e.g., '0001' instead of '1').

It is highly recommended that barcodes be created in Code 128. The barcodes shown in the table are in Code 128 format. Some other codes generate numeric check characters which MUST be terminated with an alpha character to prevent ambiguity.

The following single and paired characters should NOT be used in barcodes: A, F, E0, FF, B1, B2, B3

Appendix B—ScanVue5® Initialization File

Overview

A default initialization file (scanvue.ini**)** is placed into the share directory on the server by the installation program when the server software on the CD–ROM provided is installed. The **.ini** file must be on the server, in the share directory and the ScanVue5® units which are hard coded to look for the **.ini** file in the share directory, must find it or they will not be able to establish a connection to the network.

Software V6.20 and later will also detect filename realscan.ini as well as scanvue.ini. This change ensures that existing NCR installations can be run interchangeably. The scanvue.ini file is read by every display on that network server once a communication link is established. The .ini file controls the behavior of every unit linked to that server.

As well as defining the defaults for text display, colors and wallpaper, the **.ini** file provides a way for ScanVue5® units to be grouped together and access different slideshows as a group. For example, in a multi department store, each department can be running different slideshows at the same time, each one showing promotions or teaser advertising tailored to that department's specific products. Slideshows can be changed as desired with specially created versions for holidays or sales events.

Real Time Clock

A real-time clock display can be superimposed on the LCD screen (see Fig 17) as defined in the scanvue.ini file. ScanVue5® maintains an internal clock tick counter but does not store 'real time'. Date and time are initially set by the NTPServer and TZOffset modes in the.ini file (see example p49) or with UnitConfig and should be periodically updated by the DateTime mode from your server application. The host must be running an NTP or similar time server that the application can access for the current date and time.

The clock display font, foreground and background colors and position on the screen are defined independently of the font used for text display. This is the only case where 2 different fonts can be used at the same time. The clock feature is intended for internal company purposes rather than for customers and may be used for example, as a time clock for employees to clock in and out of the store by scanning their ID cards under the barcode reader.

Figure 17–Real Time Clock Display

Rules for the ScanVue.ini File

1. The **.ini** file is a text file consisting of sections for specifying different parameters. Each section is marked in enclosing square brackets i.e. [Group].

2. Sections may be in any order. Initialization lines may be in any order within a section.

3. Lines that start with a single quote (') or octothorpe (#) are comments. Blank lines and white space (except possibly in a value field) are ignored.

4. Initialization lines consist of a token, followed by zero or more blanks or tabs, followed by an equal sign, followed by zero or more blanks or tabs, followed by the initialization value for the token, i.e., TOKEN=Value

5. Tokens/Value pairs may be directed to an individual unit by preceding the token with the <u>Unit ID</u> enclosed in angle brackets i.e., <Tools1> Text_Rows = 4

6. Tokens/Value pairs may be directed to all units in a group by preceding the token with the <u>Group</u> name enclosed in angle brackets i.e., <Shoedept> Text_Fcolor = Green.

7. Group names may consist of alpha and numeric characters only.

8. Tokens and sections that are unrecognized are ignored. Default values are used when a token is not present.

9. Values are set in the order they appear in the file. If there are duplicate tokens in a section, the value used is the last one on the list except when a Unit ID is specified. If the Unit ID is specified, only that token/value pair will be used, regardless of the position within the section.

10. A font file must be specified (replaces the default font) if the text foreground and background colors are to be specified.

11. If the clock function is being used, a second font file may be specified for the clock display. This is the only case where 2 font files can be used at the same time.

12. The NPTServer mode sets the time when scanvue.ini is run (at boot time). To keep the clock accurate, periodic updates using the TimeDate mode from your application is recommended.

Sections & Commands

(note: commands are not case sensitive)

[DISPLAY]	Configures the way text is shown on the display.
Text_Rows	Number of rows in line–display operation mode.
Text_Cols	Number of columns or characters in line–display operation mode.
Text_Fcolor*	Foreground color for displayed text (0-255).
Text_Bcolor*	Background color for displayed text (0-255).
TextHPos	The horizontal offset from the left edge where text starts (in pixels). Must be an integral multiple of four pixels. Space must be available on the right side of the line–characters cannot be pushed off the screen.
TextVPos	The vertical offset from the top edge where text starts (in pixels). Must be an integral multiple of four pixels.
FontFile	The full path for the file that contains the font.
SlideshowFile	The full path for the slideshow file.
Msgchecking**	A text string displayed when a barcode is scanned. The default string is ***Checking…Please wait***. When the host returns the price and description, it overwrites this message. Alternatively, the value may be an image filename (*/filename*) instead of the message string, in which case the image (wallpaper) will be displayed.
MsgUnavail	A text string displayed when a barcode is scanned and the host cannot be reached. The default string is ***Unavailable…Please try later***.
POSmOut	The number of seconds that text will be displayed before it is cleared and the slide show restarted. Can only be used in the .ini file. Performs the same function as the POSTimeout mode (in UnitConfig or modeset).

*A font file must be specified (to replace the default font) to use these two parameters. The 256 color palette can be displayed on a desktop computer by running the file [ScanvueTextColors2.htm) on the CD_ROM from from a browser.
**Msgchecking can specify either a message string or an image file (called wallpaper) but not both.

[GROUP]	Assigns individual units to a group.
GroupName	The Token is the name of the group and the value is a list of one or more Unit IDs, separated by commas that belong to that group. The same group name can appear on more than one line, with more Unit IDs listed. Units may belong to more than one group.

Note: if both ScanVue5 (LCD) and Scanvue420 (VF) units are used in the same installation , the VF models should be placed in a different group than the LCD models to prevent graphics images being sent to them as they do not respond to images and will display a blank screen after the "unavailable….try later" message.

[REDIRECT]	Allows specified unit to be redirected to another initialization file
UnitID	The Token is the unit's ID number, and the value is the UNC for the new initialization file. If ScanVue5® recognizes its ID in the list of IDs, it uses the value to obtain the new .ini file. A list of which initialization files have been referenced in this process must be kept so that loops can be detected and terminated.
[CLOCK]	Superimposes a real time clock display on the LCD screen
ClockFontFile	The full path for the file that contains the required font.
Clock_Fcolor	Foreground color for the clock display (0-255).
Clock_Bcolor	Background color for the clock display (0-255).
ClockTransparent	If set to transparent, there is no text box around the display. Value=TRUE, clock text box is transparent. Value=FALSE, clock is in a text box of background color.
ClockHPos	Defines the horizontal (column) position of the left side of the clock display box (in pixels) The left column pixel is 0 and the right column pixel is 319
ClockVPos	Defines the vertical (row) position of the top of the clock display box (in pixels). The top row pixel is 0 and the bottom row pixel is 219
ClockFormat	Defines the format of the clock display. Value=0, 12 hour display without AM/PM. Value=12, 12 hour display with AM/PM. Value=24, 24 hour display.
ClockUpdateInterval	Defines the clock display update interval in seconds. If a multiple of 60 the seconds display is suppressed. Value=1 to 59 inclusive, displays count of seconds. Value=60, seconds display is suppressed.
ScanShowClock	Defines if clock display is suppressed during a scan cycle. Value=TRUE, clock display is on all the time. Value=FALSE, clock display is suppressed during a scan cycle.
NPTServer	Gets the time from a time server. Value=<IP Address>, IPaddress of the time server
TZOffset	Defines local time zone offset in minutes from GMT. Value=n, n=# minutes difference from Greenwich Mean Time. US East Coast offset is 300 (minutes) from GMT

Example of Initialization File

 # Define which ScanVue5® units are grouped together. TextOnly group are
 # VF display units (fixed size fonts) while Fourline and Twoline groups are
 # LCD display units set up for text use with specified font and colors

```
[GROUP]
ToolDept      =tools1, tools2, toolsentrance
Cosmetics     =cosmet1, cosmet2, makeup1
HouseWare     =kitchen, china, bridal, appliance
FourLine      =tools1, tools2, cosmet1, kitchen
TwoLine       =toolsentrance, cosmet2, makeup1, china, bridal, appliance
TextOnly      =stationery, tirecenter, garden
```

 # Set up the display characteristics

```
[DISPLAY]
<FourLine>    Text_Rows   =4
<TwoLine>     Text_Rows   =2
              Text_Cols   =20
<FourLine>    FontFile    =VGAfonts/cour4x20
<TwoLine>     FontFile    =VGAfonts/cour2x20
Msgchecking  = Checking….Please Wait


<Tooldept>    SlideshowFile =shows/tools.sho
<HouseWare>SlideshowFile =shows/housewares.sho
              SlideshowFile =shows/everybodyelse.sho
```

#Text colors: tool dept, brown over green; cosmetics dept, yellow over blue
#from TextColors1.htm color chart.

```
<ToolDept>    Text_Fcolor  = 44
<ToolDept>    Text_Bcolor  = 18
<Cosmetics>   Text_Fcolor  = 35
<Cosmetics>   Text_Bcolor  = 180
```

 # Members of these groups are directed to a different .ini file

```
[REDIRECT]
<HouseWare>InitFile           =tools.ini
<FourLine>    InitFile         =textonly.ini
```

#Put a real time clock display in the bottom left corner of the screen
#Clock feature only available on Scanvue5 LCD models
```
[Clock]
#Clock font is 8x14 pixels/char
ClockFontFile=C:\POS\fonts\bit8x14.gft
```

```
#Clock position is bottom left corner of screen
ClockHPos=0
ClockVPos=300

#Foreground (character) and background (display box) colors
Clock_Fcolor=35
Clock_Bcolor=180

#Make the display box disappear so the characters are floating on the image
ClockTransparent=TRUE

#12 hour clock display with AM/PM meridian
Clockformat=12

#Display seconds
ClockUpdateInterval=1

#Turn off clock display during a scan cycle
ScanShowClock=FALSE

#Get time and date from time server and send to Scanvue
NPTServer=10.12.14.16

#Pacific coast time is 8 hours (480 minutes) later than GMT
TZOffset=480
```

Appendix C—Creating a Slideshow

This section contains detailed instructions for creating a slideshow file. There are two ways to create a slideshow.   A program called Slideshow Editor and its a User's Guide is available on the CD-ROM.   An easy way to make a slideshow without having to learn to use a new program is to use a text editor like Windows® Notepad to create the script necessary to run the graphics images (slides).

A **slideshow** is a file containing graphic images and a script (the instructions) on how these images are to be displayed. Slideshow files reside on the network in the servers' share directory and are 'pushed' to the displays by commands in the slideshow file and stored in the unit's RAM memory. The slideshow is executed from within the unit.

A **slideshow** file consists of a sequential list of references to graphics images in the order in which they are to be displayed, specifying the duration each image is displayed. The file uses Token=Value pairs to define the sources of the image files. Blank lines, lines starting with a single quote (') or an octothorpe (#) are ignored, as is white space around tokens or the equal sign separating the token and its value.

Creating a Slideshow File

The **SLIDESHOW** section is a script that is interpreted by ScanVue5® as it is executed. Slideshow entries consist of two items of information: the slide image by sequence number and the duration the image is to be displayed in ticks where a tick=1/100 second. A **FRAME** may be defined to equal a number of ticks; for example FRAME=100 makes FRAME = 1 second. Frame can be shortened to F, which can then be used as the duration (F1 = 1 second or F3 = 3 seconds)

CAUTION: <u>DO NOT DISPLAY A FIXED IMAGE FOR LONG PERIODS OF TIME </u>AS THIS MAY CAUSE A PERMANENT LATENT (GHOST) IMAGE ON THE LCD. THE LCD WARRANTY DOES NOT COVER THIS EFFECT.

This effect known as "imaging sticking" is caused by an ion charge buildup in the liquid crystal material and is inherent to all AMLCD displays. The LCD manufacturer recommends no longer than 5 minutes before changing the image, the purpose being to turn 'off' the pixels that are 'on' for a period of time. This will prevent image sticking from occurring.

Using Multiple Graphics Windows

Several graphics windows can be displayed on the screen simultaneously. Multiple window displays are specified from the slideshow file. Each window can be individually sized, positioned on the screen and its display time and delay time to the next window selected. Figure 18 (p64) shows the timing diagram for the example slideshow file and the overlapping window display is shown in Figure 19.

Images used during multiple windows presentations must be sized prior to running them in the slideshow file. It is also recommended that the same color palette be used for

each of the images as the last palette loaded will affect all previous images (windows) on the screen at that time. Images can be edited with any good commercial image editing program such as CorelDraw or Adobe Photoshop. A shareware program, ImageMagik, is provided on the CD-ROM. A full screen image is 320x240 pixels thus image windows will want be smaller than this size depending on how the multiple windows are displayed For example, if 4 non-overlapping images are used to fill the screen, each image will be 160x120 pixels. The images may also overlap each other. The minimum recommended image size is 160x120 pixels—any smaller than this gets difficult to see unless it's a logo or a name.

Rules

1. Each of the 4 items can be on the same line, separated by commas or on different lines.

2. The text command **SLIDE** in an entry can be replaced with the percent sign for brevity. For example; **SLIDE15** would become **%15**.

3. Graphics image files (slides) must be in a 320x240 non–interlaced GIF–89a format.

4. Image files (slides) for multiple windows displays must be sized <320x240 pixels. All other image specifications apply.

5. The FTP server pushing the slideshow file to ScanVue5® must be set to binary mode.

Sections & Commands

[SETUP]	Reference information for the rest of the file.
Frame	Number of ticks (1/100th second increments); e.g. FRAME=100 makes FRAME=1 second. Can be shortened to F in file.
Root_Dir	The root directory for graphics images. The specified string is prepended onto the names of the graphics files in the show.
[FILES]	The list of graphics images (.GIF files) to be used in the slideshow
[SHOW]	The script for the slideshow. Controls the sequencing and timing for the slideshow.
Sliden	Where 'n' is replaced with the sequence number (which is not related to the order in which slides are displayed). Sequence numbers 1, 01, and 001 are the same sequence number. The value is the path to the file, relative to the root directory.

Multiple Windows Commands

Showtime	Number of ticks (1/100th second) the image will be displayed.

DelayNextImage   Number of ticks (1/100th second) before the next image is displayed.

@X,Y   Top/Left position of the window (in pixels). X=0 is the left edge and Y=0 is the top edge of the screen display area

Examples of Slideshows

Example 1
```
# Specify the root directory for the graphic image files
[SETUP]
ROOT_DIR = Graphics/MyShow
FRAME=100

# Here are the image files.  These all 320x240 pixel GIF images
[FILES]
SLIDE1  = FrontYard.GIF
SLIDE2  = WalkWay.GIF
%3  = Porch.GIF
%4  = FrontDoor.GIF
%5  = EntryHall.GIF
%6  = CoatCloset.GIF
%7  = FamilyRoom.GIF
%8  = Backyard.GIF
%9  = Kitchen.GIF
%10 = DiningRoom.GIF

# Here comes the slideshow
[SHOW]
SLIDE1, F10        # Slide 1 display for 10 secs
SLIDE2, F5         # Slide 2 display for 5 secs
SLIDE3, F5
SLIDE4, F5
SLIDE5, F5
SLIDE6, F2
SLIDE7, F5
SLIDE8, F5,
SLIDE9, F5,
SLIDE10, F10       Slide 10 displays for 10 secs

# End – Slideshow will now start over
```

#Example 2
```
#Multiple Windows Display
[SETUP]
ROOT_DIR = Graphics\MultipleWindows
FRAME = 500
```

#Image files for multiple window displays. For 4 quarter screen
#images, size is 160x120 pixels.
[FILES]
%11 = window1.GIF
%12 = window2.GIF
%13 = window3.GIF
%14 = window4.GIF
%15 = window5.GIF

#Here's 5 overlapping windows displayed
[SHOW]
#Format Example:
#%11 Showtime, DelayNextImage, @x,y

```
%11  1000, 250 @0,0        # paints "window1.GIF" in top left corner of
                           # screen.  Window opens for 10 secs.  2½
                           # secs after start next window arrives.
%12  750, 250 @53,40       # paints "window2.GIF".  Top left corner at
                           # 53 pixels from left edge, 40 pixels from top
                           # edge.  Window opens for 7½ secs.  2½
                           # secs after start, next window arrives.
%13  500, 250 @106,80      # paints "window3.GIF".  Top left corner at
                           # 106 pixels from left edge, 80 pixels from
                           # top edge.  Window opens for 5 secs.  2½
                           # secs after start, next window arrives.
%14  250, 250 @160,120     # paints "window4.GIF". Top left corner at
                           # 160 pixels from left edge, 120 pixels from
                           # top edge.  Window opens for 2½ secs. 2½
                           # secs after start, next window arrives.
%15  500       @80,60      # 4 prior images timeout. This image shows
                           # for 5 secs in the center of the screen then
                           # times out.  No other image is called as the
                           # DelayNextImage parameter isn't specified.
```
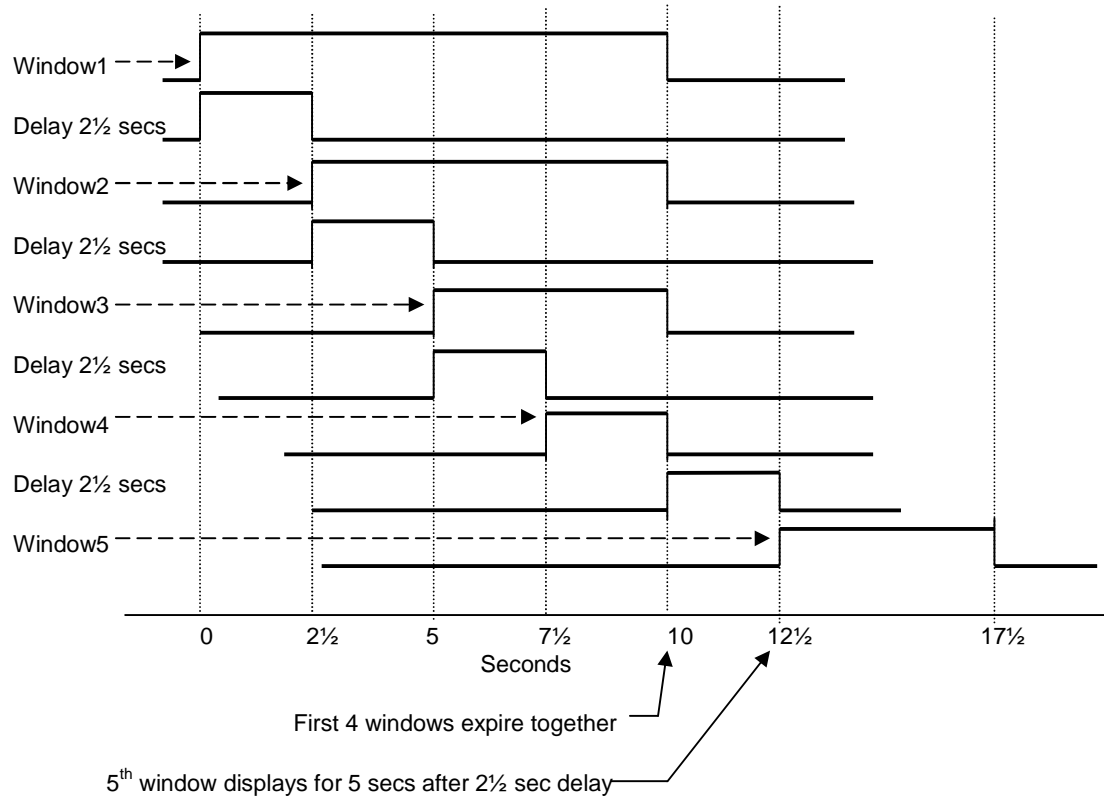
First 4 windows expire together

5th window displays for 5 secs after 2½ sec delay

Figure 18—Timing Chart for Multiple Window Example
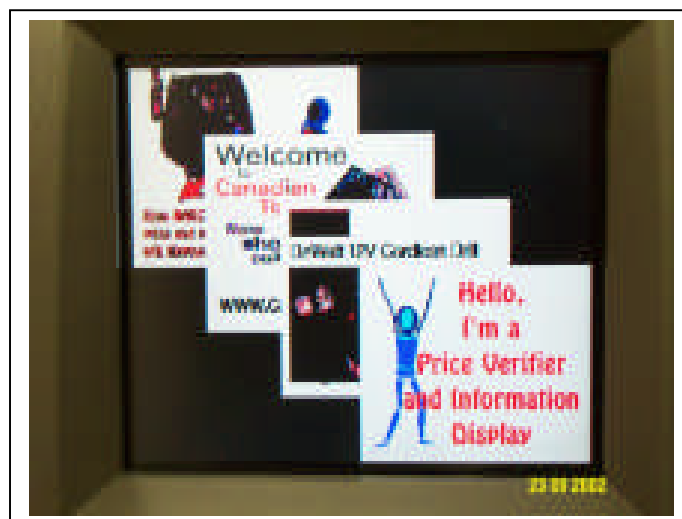
Figure 19—Multiple Graphics Windows

Appendix D—Font and Language Sets

Graphics (TFT) Display Models

ScanVue5® with TFT display has the built–in default font set shown in Table 3. The 16x32 pixel font has the extended ASCII character set (0–255) and can be displayed 20 characters per line. A different font can be downloaded when the unit boots up by specifying it in the scanvue.ini file. Only one font at a time can reside in ScanVue.

While ScanVue can display characters outside of the usual ASCII range of 32–127, many libraries will not correctly handle those characters in normal text. Nominal mode transfers should be used to write text with the extended character set (128-255).

Table 3—Default ASCII Character Set For TFT Display

Vacuum Fluorescent (VF) Display Models

VF display models have the fixed built–in character set shown in Table 4. The empty code positions from A0-DF can be filled with one of the language character sets shown in Tables 5-8 [see section on ScanVue420 p50] with European as the default.

Table 4—Default ASCII Character Set for VF Display

| A0 | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | AA | AB | AC | AD | AE | AF |

| B0 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 | B9 | BA | BB | BC | BD | BE | BF |

| C0 | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | CA | CB | CC | CD | CE | CF |

| D0 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | DA | DB | DC | DD | DE | DF |

Table 5—European Character Set for VF Display

| A0 | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | AA | AB | AC | AD | AE | AF |

| B0 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 | B9 | BA | BB | BC | BD | BE | BF |

| C0 | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | CA | CB | CC | CD | CE | CF |

| D0 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | DA | DB | DC | DD | DE | DF |

Table 6—Katakana Character Set for VF Display

A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF

B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF

	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF

N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF

Table 7—Cyrillic Character Set for VF Display

A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF

										N/A	N/A	N/A	N/A	N/A
B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF

N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF

N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF

Table 8—Hebrew Character Set for VF Display

Appendix E—ProductInfo Protocol

Abstract: This specification describes a bi–directional message passing protocol called 'Product Information Protocol', that was created especially for retail store price–verifier applications. The protocol is designed to be generic and is not tied to any specific retail hardware device. Any network topology or configuration capable of using or connecting to TCP/IP will be able to support ProductInfo based applications.

The IEE Inc. ScanVue® and ShopVue® retail products use a sub–set of the ProductInfo protocol to meet their functionality requirements. The specific implementations for these products are covered in their respective user manual application programming interface (API) section.

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Introduction

The ProductInfo Protocol provides a network–based messaging system whereby a client can obtain item price and description information about specific products. This information can be in any form such as text, graphic images, sound or combinations. The protocol will be submitted as an RFC for the Internet community.

Protocol Types

There are two forms of the protocol: trivial and nominal. The trivial version consists purely of <NUL> terminated text sent from the client to the host, or from the host to the client. From the client, it is a product query; from the host it is a text response. This may not support all the features of any particular device, so nominal mode must be used for advanced features.

The trivial and nominal cases can be distinguished by examination of the first byte; in trivial mode it will always be a printable ASCII character—in nominal it will be zero (unless you are sending individual packets in excess of 16MB). When a trivial–mode message is received by the server it is interpreted as a product query; it optionally contains the client's identification and white space preceding the product code. When received by the client, it is interpreted as a single, text response to a query. In either case, sessions are closed by the server.

In the nominal case, messages consist of a length, followed by a token, possibly followed by more information as specified by the length and the token.

Symmetry

The format is the same in both directions but the implementations at either end may or may not understand all the same tokens. In normal operation, the client opens a connection for each request, and keeps it open until the server instructs the client to close it. The client can also wait for the server to open a socket, to allow asynchronous operation. Either side may act as client, or server, or both.

Errors

In the interest of robustness, both ends will accept any message whether defined or not— invalid messages are discarded. A maximum reasonable message length may be used as a means to detect implementation bugs that could result in loss of synchronization; such errors terminate the connection. If the client detects a loss of synchronization it may send an error token following re–establishment of the connection in order to log the error on the server. If the server detects this condition, it can log it directly.

Following a query, the client may choose to take an error action if it receives nothing from the server within a defined timeout period.

Status Requests

The server can make capability queries and/or mode changes before, after, or in lieu of sending any response. The client may send capability messages regardless of whether the key name is known to the server; the server retains this information. When the server needs to know the value of one of these capabilities, it consults this retained information. If it is not known, a capability query may be sent and the server may wait a moment for a reply to be received. This reply will asynchronously update the server's information, and the value should be found there by a subsequent lookup following the brief interval required for the client to respond to the query. If it remains undefined, it can be assumed that the client declined to respond, most probably because that capability name is not known to it.

Client Mode Changes

The notion of a mode setting is to allow the server to select between optional behaviors or parameters in the client. If the server wants the client to adopt a certain mode setting, it sends the command. The client will do so, if applicable. If not, optionally, an error report may be generated in response. Mode values are set by using token–value pairs. Mode values can be queried by sending the mode name alone. Error reports are used primarily as a debugging tool. The string starts with an error number, optionally followed by white space and explanatory text.

Packet Types

Packet Types			Data Types	
Function	**Token**		**Function**	**Token**
Terminate connection	TERM		No Operation	NOP_
Capability query	CAPQ		Display Text	TEXT
Capability response	CAPR		Special Text[1]	SPEC
Mode Set/Query	MDSQ		UNC	UNC_
Mode Response	MODR		URL	URL_
Error report	ERR_		File	FILE
Product query	PROD			
Data	DATA			
Registration	RGST			
Event	EVNT			

[1] The meaning of any Special Text is implementation–defined.

Nominal Mode Packets

General

Every nominal–mode packet starts with a header containing the packet length and the token and may contain no other data. Packets are described below.

Terminate Connection:

Requires only the length and the token.

	Length			Token			
Byte #	0	1	2	3	4	5	6	7
	0	**0**	**0**	**8**	**T**	**E**	**R**	**M**

Capability Query:

The name of the capability to be queried is a string following the header. Capability names are case insensitive. The header for a SendUnitID capability query would be

Byte #	0	1	2	3	4	5	6	7
	0	**0**	**0**	**19**	**C**	**A**	**P**	**Q**

The query string "SENDUNITID" and a terminating <NUL> immediately follow the header.

Capability Response:

If the capability being queried is known, a response is sent. The name of the capability and its value is a string in token/value format following the header. The header for a SendUnitID response might be:

Byte #	0	1	2	3	4	5	6	7
	0	**0**	**0**	**24**	**C**	**A**	**P**	**R**

The response string "SENDUNITID=TRUE" and a terminating <NUL> immediately follow the header. There can be white space on either or both sides of the equals sign. The value starts with the first non–white space character. Values can be empty. If the capability query is a zero–length string, ScanVue® responds with a <CR><LF> separated list of all supported capabilities and their types. If the query is a single axterix ('*'), ScanVue5® will respond with a <CR><LF> separated list of modes and their values.

Mode Set/Query:	The name of the mode and its value are in a token/value string following the header. If the mode name alone is in the string, it is a query. Mode names are case–insensitive. The header for a SendUnitID query would be:	

Byte #	0	1	2	3	4	5	6	7
	0	**0**	**0**	**19**	**M**	**D**	**S**	**Q**

The query string "SENDUNITID" and a terminating <NUL> immediately follow the header. To set SendUnitID, the string would be (e.g.) "SENDUNITID=ON", and byte 3 would be 22 instead of 19.

Mode Response: If the mode being queried of set is known, a response is sent. The name of the mode and its value is a string in token/value format following the header. The header for a SendUnitID response might be:

Byte #	0	1	2	3	4	5	6	7
	0	**0**	**0**	**22**	**M**	**O**	**D**	**R**

The response string "SENDUNITID=ON" and a terminating <NUL> immediately follow the header. There can be white space on either or both sides of the equals sign. If the mode query is a zero–length string, ScanVue will respond with a <CR><LF> separated list of all supported modes and their types in the form "MODENAME=TYPE,SIZE" where TYPE is BOOLEAN, NUMBER, or STRING, and SIZE is the number of bytes in the STRING and only appears for STRING. If the mode query is the single–character string "*", ScanVue will respond with a <CR><LF> separated list of all supported modes and their current values.

Error Report: Error reports are primarily intended for debugging purposes. If enabled, error reports are sent if, for example, the host queries a capability that the client does not accept. Such error strings are in the format of a number possibly followed by white space and explanatory text. There is no assignment of numbers to specific errors, but the value zero should be reserved for non–error conditions. An "OK" error response could be:

Byte #	0	1	2	3	4	5	6	7
	0	**0**	**0**	**13**	**E**	**R**	**R**	**_**

The response string "0 OK" and a terminating <NUL> immediately follow the header.

Product Query: The product query string immediately follows the header. The header for a request about product ABC would be*:*

Byte #	0	1	2	3	4	5	6	7
	0	**0**	**0**	**12**	**P**	**R**	**O**	**D**

The query string "ABC" and a terminating <NUL> immediately follow the header. Mode settings can cause the client to send its unit ID and a <TAB> character before the product data, and/or add terminating <CR> and/or <LF> characters at the end of the query string.

Data: Data can be one of several types. The data–type token immediately follows the packet–type token, and the data follows after that. The header for a data packet to display the word "hi" would be:

Byte #	0	1	2	3	4	5	6	7	8	9	10	11
	0	**0**	**0**	**15**	**D**	**A**	**T**	**A**	**T**	**E**	**X**	**T**

The data string "hi" and a terminating <NUL> immediately follow the header.

Registration: Registration information consists of three sequential <NUL> terminated strings following the header. The first string is the unit ID, the second is the product–type identification, and the third is the IP address of the registering client. The header for a registration packet for "Entry", product type "SCANVUE5[®] 200102161901", and IP address of "10.0.0.227" would be:

Byte #	0	1	2	3	4	5	6	7
	0	**0**	**0**	**79**	**R**	**G**	**S**	**T**

Each registration string and its terminating <NUL> immediately follows the header or the previous registration string. When a client receives a registration packet, it should respond by sending its own registration.

Event: A client can support up to 32 application specific events and can report the beginning and end of each event with a 100th second timer (which need not be supported). Events are mapped into a 32–bit word, in standard network order. Clients may allow the host to enable and disable individual events, or to select reports only for starting or ending events. The packet header for events from UnitID "Unit1" is:

Byte #	0	1	2	3	4	5	6	7
	0	**0**	**0**	**26**	**E**	**V**	**N**	**T**

Immediately following the header is: the 32–bit map of events that have started since the last report, the 32–bit map of events that have ended since the last report, a 32–bit timer value and a NUL terminated string that is the sending unit's UnitID. The bytes following the header if event zero started and event one ended at time 5 from UNIT1 would be:
0 0 0 1   0 0 0 2   0 0 0 5   85 78 73 84   49 0.

Client Requirements

Capabilities

The following capabilities must be supported by a client:

Timeout	Changing the client's protocol timeout value is supported.
SendUnitID	Sending the unit's ID can be enabled and disabled.
TrivialComm	Controls the default communication method used for queries.

Modes

The following modes must be supported:

|	
Timeout	Hundredths of a second represented in a 32–bit value. This specifies the amount of time that a client will wait, after sending an initial query, before it terminates the connection to the server and displays an error message (if no other response has been received). The default is 300 (3 seconds).
TrivialComm	Controls the communication method used for queries. The default is TRUE. The response to a trivial–mode query need not be in trivial–mode.
SendUnitID	Controls the inclusion of the Unit ID in a trivial–mode query. The default is TRUE.
SendError	Controls the sending of error reports. The default is FALSE.
SendResponse	Controls the sending of responses to mode set commands. The default is FALSE.

Appendix F—Mounting Bracket Outlines
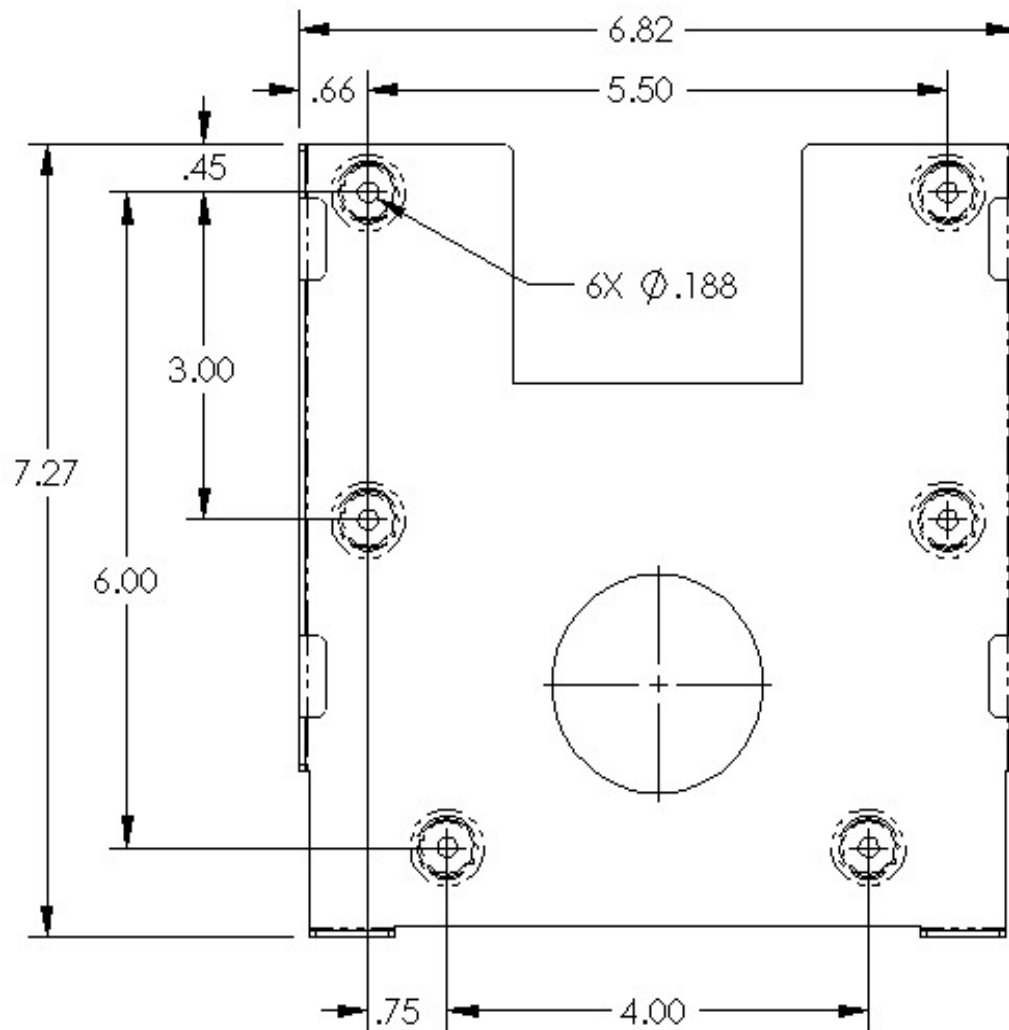
Figure 24—Slimline Wall Mount Bracket
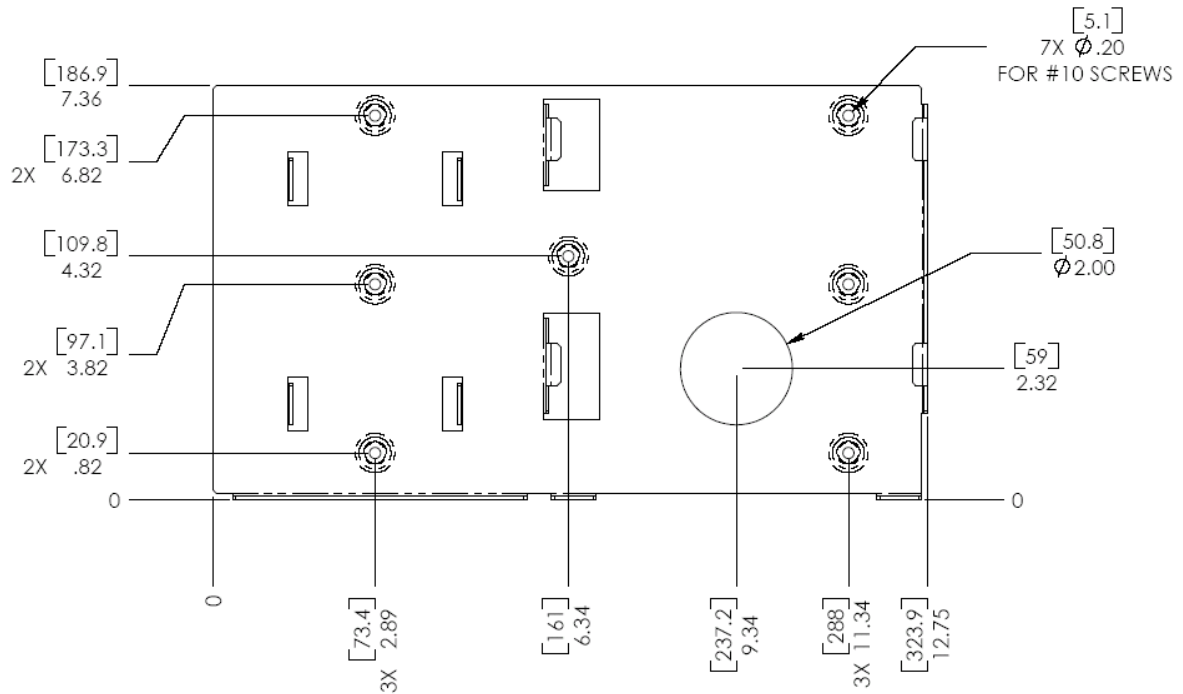
Figure 25—Co-Located Printer Wall Mount Bracket

Appendix G—Application Notes

Wallpaper

Description

In its default configuration, scanning a barcode will bring up a 'Checking…Please Wait' message in yellow characters on a blue background. When the server returns the price and description of the scanned item a new screen will replace the 'Checking…'screen. A user–defined image called 'wallpaper' can be displayed instead of the default message while waiting for the server to return the product information.

Wallpaper is a static image that is displayed immediately after a barcode scan and is used as a graphic backdrop for the price and description text that follows the barcode scan query. If wallpaper has to display a 'Please Wait' or similar message, that text must be embedded into the image (this is not to be confused with text over graphics or mixed mode operation). Another purpose for wallpaper is to provide labels for the four optional pushbutton switches (see Fig 28). Again, these labels must be embedded into the wallpaper image.

Immediately following a barcode scan the slideshow is interrupted and wallpaper is displayed. The item price and description returned as a result of the barcode query are overlaid on the wallpaper image. This is true mixed mode (or text over graphics) operation (see Figure 29). After a user settable timeout, the wallpaper and text will be terminated and replaced by the slideshow until the next barcode scan.
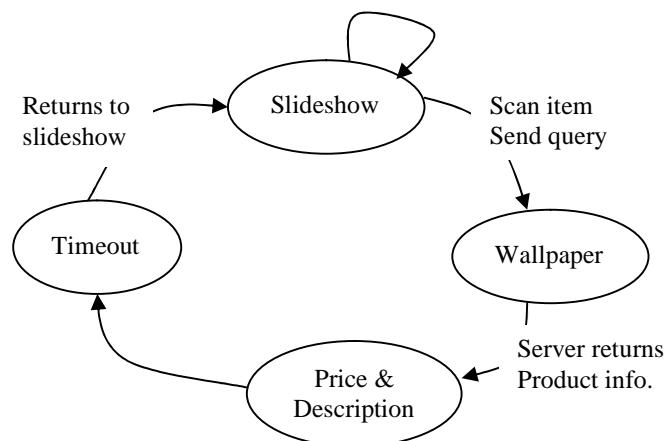
Figure 26—ScanVue5® State Diagram

Industrial Electronic Engineers, Inc.

Creating Wallpaper

A typical wallpaper might consist of a background image, for instance a company logo, with "Please Wait…" or a similar message in the center of the image and a one character high row at the bottom of the display containing text labels for the 4 switches (if the switch option was ordered). This is a single homogeneous GIF image created using a suitable image editing program that allows text to be embedded into an image*. A shareware image–editing program "ImageMagick" is included on the SDK CD–ROM. Programs such as PC Paint, Adobe Photoshop or Corel Draw will do this easily if you are more familiar with them.

• Remember, any image you create must be in 320x240 pixel, non–interlaced GIF89a format

Figure 27—Wallpaper Image

Using Wallpaper

Once the wallpaper image has been created, copy it to the \pos\graphics subdirectory on the server (assuming \pos is the share directory). The preferred method of loading the wallpaper image into ScanVue5® is to include a line in the [Display] section of the ScanVue.ini file **MsgChecking = /graphics/wallpaper.gif** where wallpaper.gif is your wallpaper image file name. The wallpaper image will be downloaded into ScanVue5® the first time the scanner is used. An alternative way of loading the wallpaper is to enter the filename and path into the **MsgChecking** row in the **UnitConfig** program.

When a barcoded item is scanned and the wallpaper is displayed, price and description from the server must be sent back using mixed mode (text over graphics mode). The text is sent inside a TIB (text information block). The TIB is defined at the server in terms of # characters wide, # characters high and location in pixels (H,V) of the top left corner of the TIB. Character font, size, foreground and background colors must be defined and known before the TIB can be defined. The TIB boundaries (and the text inside the TIB) will then overlay the wallpaper image, in the color defined as the background color.

Figure 28—Text Over Wallpaper

Text Over Graphics (Mixed Mode) Operation

When text is sent to ScanVue5® and overlays a graphic image without destroying the graphic, this is known as mixed mode (or text over graphics) operation. To use this mode of operation a graphic image file name is specified on the **MsgChecking** line in UnitConfig instead of the default "Checking….Please Wait" text message. This image is called wallpaper and will appear every time an item is scanned with the barcode reader. In addition, the **TextDisplay** line in Unitconfig must be set to **MIXED**.

Text over graphics may only be used with wallpaper—in other words, you cannot send a random graphic and then send text to overlay it. The implied restriction here is that the graphic image is always the same unless you send a new one to replace it.

In **Mixed** mode, text is displayed inside a text information block (TIB). The TIB is opaque and covers the image. As long as the TIB is smaller than the full 320x240 image size some of the image will show around the edges of the TIB. A TIB could be defined to be as small as 1 character wide x 1 character high and might only cover a small part of the image. If the **TextTransparent** mode in UnitConfig is set, the TIB becomes transparent and only the text characters are opaque. Depending on your application, this might have a more pleasing look.

ScanVue5® can only have one 256–color palette at a time. When text is displayed any palette can be loaded. When text is displayed over a graphic the palette from the graphic should be used as it's easier to modify the text color than to deal with a corrupt appearing image. The best way to handle this is to have your art department use the same palette for all their work or reserve certain indices for certain color values.

Default Text Setting
The default text setting is 7 rows x 20 characters. At the default font and character size, the TIB will cover the whole screen except for about 8 pixels top and bottom. If you do not change the default settings it will appear mixed mode doesn't work correctly. We recommend you set the text to 2 rows or make the font much smaller before you start experimenting. Change it in the ***ScanVue.ini*** file.

Define the TIB using modeset commands. The parameters are height in # characters, width in # characters, background color, foreground (text) color and the location of the top left corner TIB in pixels from left and top edges of the screen.

Single TIB
The normal mode of operation after an item is scanned is for the wallpaper to display, a text message (TIB) is sent by the host and overlaid on the wallpaper and then the host should hang up. If the host doesn't break the connection, ScanVue5® will sit and wait for another TIB and will appear to be hung. It will eventually recover (~30 min timeout), but the preferred way to ensure this doesn't happen is set the mode **SingleQTrans** to **TRUE**. This will force ScanVue5® to close the connection after the first TIB is received.

If you are sending multiple TIB's, then set **SingleQTrans** to **FALSE**—however, the host must ensure the connection is broken after the last TIB sent or ScanVue5® will sit and wait.

Creating Customer Messages on VF Display Models

The ScanVue420 VF display model has 4 language character sets, ASCII+European (default), ASCII+Cyrillic, ASCII+Hebrew and ASCII+Katakana that can be changed with a mode command from UnitConfig. The 4 extended language sets are shown in Appendix D.

There is no display formatting utility or language character conversion capability in this version, so messages (80 characters max including blank spaces) must be padded with spaces to center text or get it to appear as you want on the display. Non standard ASCII characters—this means almost all characters other than English upper and lower case and symbols, must be entered in hex code format.

Network Messages

Three (3) network related customer messages generated within the price verifier can be changed by the user. The default messages are: **Checking….. one moment please** (Mode=msgChecking) and **Unavailable…..please try later** (Mode=msgUnavail) and the **Default text** message (Mode=BannerText). Using the UnitConfig program, locate the mode (row) for the message you want to change, highlight the New Content box and enter the new message.

Figure 29—UnitConfig Screen, msgChecking Mode

When the message has been entered, click the buttons Set Mode, Commit and Restart in sequence. **Wait….** The unit will reboot but it takes about 1 minute before the initialize screen appears.

Example 1:
Changing **" Checking…   one moment please "** into Spanish.

Highlight the New Content box in the msgChecking row as shown in Figure 28 above.

Enter   **"   Verificando…   Un momento por favor"**

The quotes delineate the starting and ending positions of the message including spaces. In this message, there are 3 blanks at the start of the top line and 3 blanks at the end of the top line to center the word **Verificando...** The U in Un starts at the 1st position in the second line (as the display word wraps after the 20th character). As the second line is exactly 20 characters, there are no blanks inserted and the quotes close off the message after the word **favor**. This message entered as shown will display;

```
     Verificando...
Un momento por favor
```

Example 2:
Change **" Checking…   one moment please "** into French.

Highlight the New Content box in the msgChecking row as shown in Figure 28 above.

Enter **"V\xC6rifier.. Un moment   s'il vous pla\xCCt "**

In this example, 2 of the characters **é** (hex code \xC6) and **î** (hex code \xCC) are non standard and must be entered using the hex code method shown on page 43. When counting characters, hex codes occupy 1 character space position on the display. The message as entered will display as:
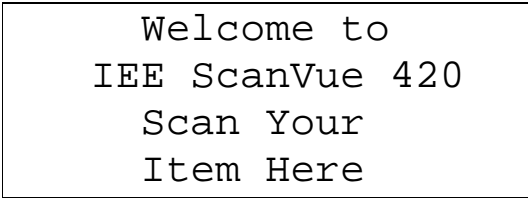
```
Vérifier.. Un moment
    s'il vous plaît
```

Greeting Message

Example 3:
Change the **Default text** English greeting message shown below to Spanish.

```
Welcome to
IEE ScanVue 420
Scan Your
Item Here
```

Figure 30—Default English Greeting Message

Highlight the new Content box in the BannerText row.
Enter
" D\xC6 la bienveida   a ScanVue420   Escudri\xCEe su   Art\xCAcule aqu\xCA   "

In this example text file the hex codes count as 1 character space.
The new text file will display as shown below.

```
Dé la bienvenida
 a ScanVue420
 Escudriñe su
 artículo aquí
```

Figure 31—Spanish Greeting Message

Appendix H—Expanded Text API

With the standard text API, only one font size with a single foreground and background color can be displayed at a time. To support different fonts and colors on the screen at the same time, usually done within defined window areas (known as text boxes), an expanded text API is provided so that multiple text boxes can be defined, positioned and displayed with each text box having its own character property controls (font style, size and colors).

Up to eight (8) text boxes can be placed on the screen similtaneously including the default text box defined in the INI file. Each different font style used must be in a new text box, but each character within a single text box can have a different foreground and background color selected from the 256 colors available on the color palette. Any text box may be defined as "transparent" in which the text in that box will appear to float on top of the screen image or wallpaper with no visible text box background color. The whole text box is transparent not just individual characters.
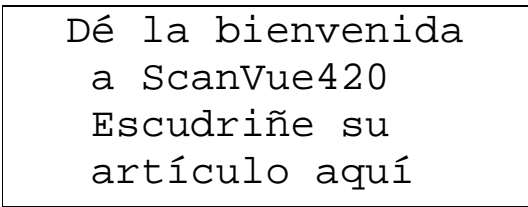
API Notation

Items in braces { and } are optional. If not explicitly specified, the last value used for that item (the default value) is used. Items in angle brackets < and > are parameter values and are described in the text following.

Defining a Text Box

The following section describes how to define a text box. Up to 8 different text boxes can be defined. Once a text box is defined, it retains its properties until the unit is powered down or it is changed by another text message to that box even if its no longer being displayed.

Except for the default text box in the .INI file, text boxes are created at run-time by an escape sequence. A text box can be changed at any time, which deletes the old box and creates a new one. A text box can contain many different colors but only a single font. If the text box is set to transparent, the whole text box not individual characters within that text box are transparent. Text boxes are identified by an ID # from 0-7.

Text boxes can be created with either trivial or nominal mode packets. Currently, no error reporting is provided.

<ESC>[D<ID>;<Fc>;{<FONT>};{<Fg>}{,<Bg>};{<Cr>}{,<Cc>};{<Ph>}{,<Pv>};{<TO>};

> where:
> <ID>   Text Box ID #, ASCII 0-7. 0 is the .INI default text box
>
> <Fc>   Control Function—2 decimal digits, 0-9
>   00 = mixed text (text over an image)
>   01 = transparent text
>   02 = exclusive text

<FONT> The font file (specify in same way as in the .INI file)

<Fg>   Foreground text color, ASCII 0-255
<Bg>   Background text color, ASCII 0-255

<Cr>   Count of text rows
<Cc>   Count of text columns

<Ph>   Horizontal pixel position of top left corner of box
<Pv>   Vertical pixel position of top left corner of box
       where top left corner of the display is 0,0

<TO>   Text timeout

Important note: while the parameters in <> are optional, the semi-colons are not.
For example:

<ESC>[D1;2;fonts/bit16x32.gft;;1,2;16,16;;

defines text box 1 with the current default text colors and timeout. Those values come from the default text box (0).

Text Color

The foreground and background colors of each character in a string can be set with the following ESCAPE sequence.

<ESC>[C{<Fg>}{,<Bg>};

where:
C is the character
Fg and Bg are the are the color palette index numbers (0-255) for the foreground and background colors respectively.

If either parameter is omitted, the current values will be used. If this is the first text color control in a message the values will be those specified for the box. If this is not the first text color control in a message, the values set previously will be used.

Example:
The following sequence sets the foreground color of character C to index 5 and the background color to index 253.

<ESC> [C   5   ,   2   5   3   ;
   $1B_h$ $5B_h$ 43_h 35_h $2C_h$ 32_h 35_h 33_h $3B_h$

Writing to a Text Box

Specify the text box ID # and the text to be displayed

<ESC>[<ID>;{<TEXT>}

The text string can include text color controls.   Text sent without a box ID # will be inserted into the default text box, ID=0.

Text Timeout

When sent as part of a text message, causes the current text box to timeout (be removed from the screen). The TO value is the ASCII number of seconds

<ESC>[T<TO>;

Mixed Fonts Example:

while a text box can only contain a single font, several transparent text boxes can be placed on top of a non-transparent box to provide the same effect as multiple fonts in a single word. The following example creates three text boxes to display Einstein's equation $E=mc^2$

<ESC>[D1;2;fonts/bit16x32.gft;35,180;1,2;16,16;10;E=

<ESC>[D2;1;fonts/bit8x16.gft;30;1,2;48,24;10;mc

<ESC>[D3;1;fonts/bit8x8.gft;5;1,1;64,20;10;2

Appendix J—IEE FTP Site

IEE's FTP website has the full content of the SDK CD-ROM and software upgrades to the price verifier unit.   Any or all of these files can be downloaded to a computer.

The easiest way to reach IEE's FTP web site is with Microsoft's IE Explorer.   The steps to get to the FTP website are as follows.

1. Using IE Explorer, address to ftp://ftp.ieeinc.com/
2. Verify the correct website is found by checking the blue bar at the top.
3. You should see a single folder called "incoming" or possibly it will be blank.
4. Click on **File** on the menu bar.
5. In the dropdown menu click **Login As…**
6. In the window enter **User Name: IEEMorse** and **Password: warcode**

This should get you into the FTP site. You will see a number of folders.   The upgrade folders for VF and LCD can be downloaded—read all the instructions before you try to upgrade a unit.

The folder called IEE has the complete contents of the SDK CD-ROM. This complete folder or only specific folders or files may be downloaded as you wish.

Appendix K—Running an Open Socket

The price verifier is designed for a socket listener on the host server to open port 1283 from an inquiry from the price verifier and close the port when the request is complete.

A special mode has been implemented that will send keep-alives to the socket at the frequency entered into UnitConfig.   In this mode, the socket is kept open as long as the keep-alives are sent. Other processes can be run between the price verifier and the host that are unrelated to the price verification task.

To keep the socket open: enter any non zero integer (seconds) into the KeepAliveTime mode in UnitConfig. Factory default is socket normal.

Appendix L—Network Diagnostics

Diagnostic Configurations

If you are having problems communicating with ScanVue5® units, we highly recommend that you download a progam called **WireShark**® and its technical documentation from the www.wildpackets.com web site. The prior version is called **EtherHelp**® . This is the resident part of a remote network diagnostic tool IEE owns and uses for troubleshooting network problems. There is no charge for this tool. Three useful network configurations for troubleshooting are shown below.

This configuration provides network security while allowing the collection of the required diagnostic information.

This stand–alone configuration allows the easy collection of diagnostic information.

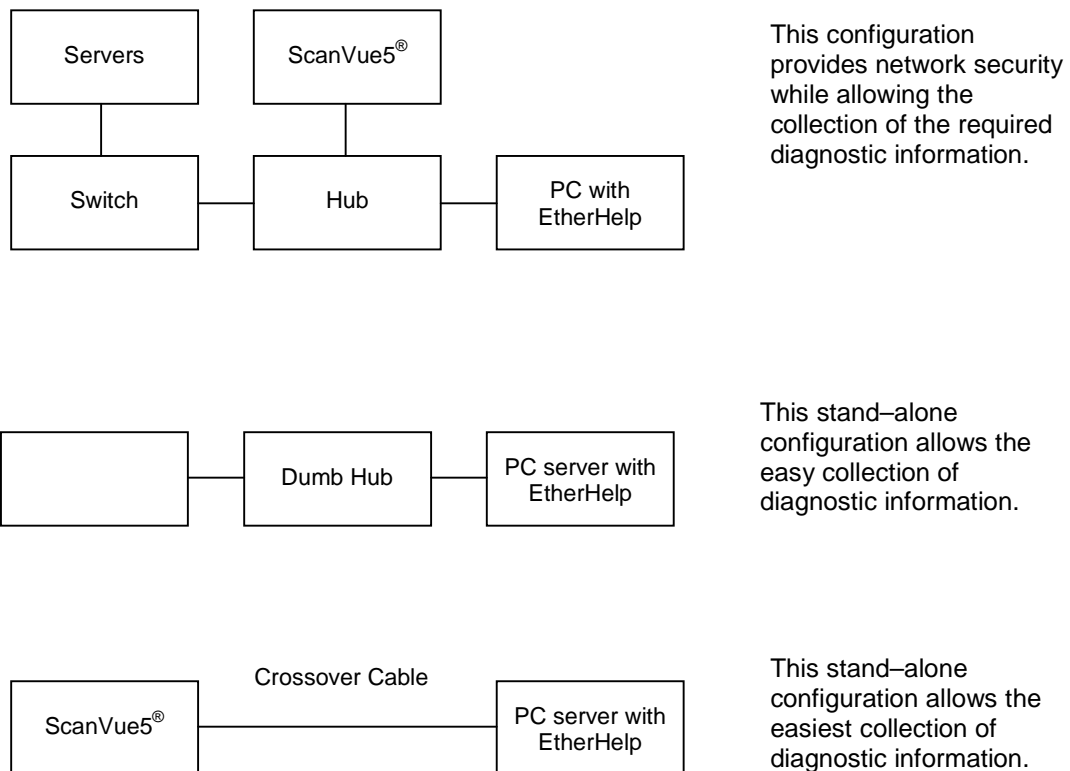This stand–alone configuration allows the easiest collection of diagnostic information.

Figure 13—Diagnostic Configurations

The hub must be a "dumb" or passive hub i.e., one that does not do any routing. If a switch or intelligent hub is used, EtherHelp® will not be able to capture all of the packets from the ScanVue. When in doubt, the crossover cable is the best solution.

Diagnostic Screens and Messages

Version 3.10 and later software has a built in diagnostic that will automatically attempt to determine and resolve network connectivity problems when the unit is powered up. By their very nature diagnostics are not completely fool proof, but they are powerful tools and many times can pin point problems exactly or provide a strong clue to the actual problem. The host must be able to ping the unit for the diagnostics to be meaningful.

Diagnostic screens have a bright red background, with text displayed in yellow on a blue background. The first line of the display will indicate the type of connection being attempted–Windows networking (SMB), FTP, or Quick File Exchange (QFX). The unit will display, at most, one diagnostic screen between restarts. If you have multiple problems they will show up one at a time.

The second line indicates the general class of error, **Internal**, **Connect**, or **Transfer**. The third line will name the specific error, and if a file name is involved, it will be displayed on the fourth line.

Internal Error

An **Internal** class error usually relates to a ScanVue5® device failure and should never be seen. If the unit can be pinged it is working well enough to eliminate device failure as a cause of not connecting.

Transfer Error

Transfer class errors indicate problems with transferring data over the network after a connection has been established to the host. Again, the explanations provided are not necessarily the only possibilities.

Data Transfer	The unit is not able to send messages to the host even though it has a valid connection. This can be caused by broken server software or for some protocols, by firewalls between the unit and host.
File Unavailable	The requested file doesn't exist or security makes it unavailable. This diagnostic message may display even if everything else is working. It indicates a failure to get the .INI or the slideshow file. This message will display if the files are available but one of the graphics is not. This is generally a recoverable error. For the INI and slideshow files, the unit will get them when they show up; graphic files are bypassed.
No Attribute	This indicates that the Windows server has the file, but cannot provide its size or time stamp. This is a failure on the host or server.

Connect Error

A **Connect** error is the most likely type to occur. The explanations given may not be the only possible reason for the message.

Connect Fail	A general failure to connect to the host. If the host can ping the unit, getting this error should not be possible.
Connect Timeout	The initial connection was made but the host has not responded to further communication in timely manner.
Refused	The host is there and the unit can connect to it. The host may not have an appropriate server running, or security may otherwise refuse to allow the connection.
Logon	The user name and/or password are incorrect.
Protocol Fail	For Windows networking, the unit and the host could not find a mutually acceptable protocol level.
Share Unavailable	The directory requested does not exist, or is not shared, or protections prevent the unit from connecting to it.
Host Resolution	The specified host name cannot be resolved to an IP address. This can happen if the host name is incorrect or if the host is on another subnet and there is no WINS server available or the WINS server IP has not been set.
Transfer	This may be a transient error that will not re–occur if you power cycle the unit and try again. Normally you should never see this message, as it indicates a failure of software and/or hardware on the host, the network, or on the unit.
SMB Connect Refused	This can occur in the following the following cases:

    1. The share POS directory is not accessable; either because the share does not exist, or user permissions are not set to allow access.

    2. The scanvue.ini file may not exist in the share.

    3. The share may exist but access may be denied because "Guest" account is disabled, or the account identified to access this share may not be applied to the permissions

tabs (remember there is both a Sharing tab and a Security tab).

4. The user account identified may not be set in the Unit Configuration of the ScanVue unit, or the password for the account may not be set correctly.

Change history

Date	Page	Change
4/27/01	47	Replaced backplate bracket dwg with later revision
4/27/01	24	Added explanation to TextHPos command
4/27/01	5	Changed length of extender cable to 6' and made it an accessory
5/3/01	34	Added rule 7. FTP server must be set to binary mode.
5/3/01	i	Added patent # to cover sheet
5/14/01	25	Added FlashHash to Misc. Modes
5/14/01	25/26	Added UnitStatus to Misc Modes
5/17/01	36	In Slideshow section changed QVGA directory to ROOT_DIR
6/8/01	1	Changed rev to D and S/W version to 3.14 in Introduction
6/8/01	11	New section: ScanVue Software Updates
6/8/01	15	Added desc of internal failures
7/6/01	36	Added CAUTION regarding image sticking
7/6/01	36	Removed references to slide transitions in overview and rules
7/6/01	9	Added section on RF installation
7/17/01		Moved section on diagnostics
7/18/01	24	Added 2 modes SMB protocol for Wireless RF operation
8/6/01	5/6	Changed Pole/Column mounting description
8/9/01	39	Changed seconds to ticks, defined FRAME
8/9/01	27	FTP Server–add note about not applicable to Linux
8/9/01	28	USER1 added "up to 255 characters"
8/21/01	44	Moved old Appendix F "mounting brackets" to end, now Appendix H renumbered figs.
8/21/01	43	Added new Appendix F "convert to RF Operation
8/22/01	27	Added description of EventStart/EventEnd re buttons
8/24/01	26	Added new modes; diversity and wireless
8/24/01	42	Added barcode labels DNxxx..;NNlss..;WNnn..;ASnn..
9/10/01	33	Added footnote superscripts tp commands
10/5/01	33	Added new barcode labels info screen display and safe reboots
11/07/01	iii	Added RF card on "standards certification" page
11/07/01	32–34	Revised barcode configuration section.

Date	Page	Change
12/4/01	27	Added QueryPadTo mode
1/23/02	34	Added 'Recall Defaults' bar code to table
1/23/02	34	Changed note 2 to make it clearer
2/28/02	12	Deleted installation of Slideshow viewer
2/28/02	34	Added barcode to reset unit to factory defaults
3/10/02	9	Added section for hand scanner configuration
3/29/02	17	Added WEP 128… Security
3/29/02	31	Added WEO 128…modes
4/16/02	34	Added default serial port settings to barcode Appendix
4/16/02	62	Added note about SingleQtrans mode when using mixed mode
4/19/02	59	Added Application note appendix H
4/22/02	30	Added new mode WallPaperEvent to control switches
8/22/02	all	Added Figure 9—renumbered figures through document
8/22/02	iii	Changed UL recognized to listed. Added EU EMC standards
8/22/02	1	Changed revF to revG and 4.13 to 4.16
8/22/02	2	Added RS232 port to technical description
8/22/02	9	Changed default ESSID to 'INSTALL' from 'IEE'
8/22/02	12-13	Added section 'Adding a Serial Printer'
8/22/02	20	Add paragraph. Symbol access points do not support shared WEP.
8/22/02	34	Added mode Port2Function
8/22/02	49-50	Added RF upgrade kit part no and revised text.
9/17/02	47	Added graphics characters (double byte text)
9/17/02	41,61-63	Added multiple windows and modes
9/17/02	55-59	Added clock display modes
9/17/02	41	Added transparent text mode
9/17/02	25	Added section on information and RF quality screens
9/17/02	20	Added examples of modeset syntax
10/8/02	40,41	Added more info to section on Scanvue420 VF display
10/8/02	58-61	Added VF character sets to Appendix D
10/24/02	22	Changed WEP description and settings

Date	Page	Change
10/28/02	51	Added TextHpos, TextVpos, PosmOut, Msgunavail modes
10/28/02	37	Add note about pSOS+ to Flashhash mode
10/28/02	38	Added new section "programmatic modes". Moved UnitStatus, Timout and GiveHelpText modes into this section
10/28/02	31	item 7, removed 'fontfile' mode. item 10, changed appendix C to D
10/28/02	32	Changed note text under Scanvue FTP Server.
10/28/02	37	Add new mode 'BypassNCRPrefix'
10/29/02	64 on	Renumbered figures from 19 onward (2 had same number)
11/1/02	77	Corrected fig callouts (fig 20 is fig 28; fig 21 is fig 29)
11/5/02	44,45	Added note 7 to items in Table 2
11/5/02	Various	Image and table cleanup, no content change
11/22/02	37	Added mode ExtCharacterSet
11/22/02	44-46	Changed section on Scanvue420—added language capability
11/22/02	84-86	Added application examples of changes to customer messages
11/22/02	19	Changed description of RF statistics screen
05/15/03		Changes from Rev H to Rev J
05/15/03	1	Add "touchscreen" to text
05/15/03	2	Add NOM, TUV to Scanvue Description
05/15/03	4	Change cable desc and P/N. Add NCR K590 printer cable
05/15/03	9	"Entering the ESSID" add case sensitive
05/15/03	10	"Adding a Hand Scanner" add para NCR 7837 hand scanner
05/15/03	12	"adding a serial printer" rewrote for clarity
05/15/03	12	'Wiring and configuring the serial port" rewrote for clarity
05/15/03	14	"UnitConfiguration" rewrote for clarity
05/15/03	16	Changed text "slideshow from 2-50 sequential images"
05/15/03	17	"Quickstart" add ref to "Quickstart for Windows XP"
05/15/03	19	"Unit Config" change text: controls to commands
05/15/03	19	"modeset" insert "DOS" before "command line program"
05/15/03	20	"Configuration Rules. Rewrote #1
05/15/03	28	"Software Developers Kit SDK" rewrote "setupserver.exe", "unitconfig.exe" and deleted "servinstall"
05/15/03	32	Insert text "UnitID" 19 characters max

Date	Page	Change
05/15/03	37	Add new values to Port2Function
05/15/03	37	Add new mode;Port2Input
05/15/03	41	"Using Graphics Characters" added text from "Note:….
05/15/03	46	Changed push command format
05/15/03	47	"Configuring Scanvue5" change text "create barcode labels in code128
05/15/03	48	Change text. "2. Scan the following label…"
05/15/03	49	Change following barcodes in table to remove trailing Q. WIN SERVER IP; DOMAIN/WORKGROUP; PRODUCT INFO PORT; PRODUCT INFO TIMEOUT; WIRELESS RF; 10BASET ETHERNET; DIVERSITY ANTENNA; PRIMARY ANTENNA;
05/15/03	50	Change following barcodes in table to remove trailing Q. SECONDARY ANTENNA; SAVE CONFIGURATION; FACTORY DEFAULTS; REBOOT UNIT; SCANNER DEFAULTS; SHOW CONFIGURATION SCREEN 1; SHOW CONFIGURATION SCREEN 2; SHOW WIRELESS STATS;
05/15/03	50	Add 5 WEP encryption barcodes, 2 MUX barcodes and Reboot Immediate barcode
05/15/03	51	Change text "Bar coded commands…" and next para "it is highly"
05/15/03	87	Add new section "Greeting Messages"
05/15/03	42	Add new section "Using Input Devices"
05/15/03	36	Added new input devices to Event mode description
05/15/03	57	Added note to GroupName about mixed LCD and VF units
05/15/03	59	Made some changes to example of .ini file
05/15/03	14	Added note about updating Windows with latest patches
05/15/03	9	Line 3--step 4 should be step 1.
05/15/03	9	In section "load ESSID" changed "record settings" barcode to "save configuration and reboot"
05/15/03	17	Quickstart section—changed page ref to diagrams from p10 to p24
05/15/03	29	Corrected ref to Fig 10 to Fig 14
05/15/03	46	Section "Operation"—add text starting "The mode SendUnitID…"
09/24/03	91	Added Appendix J—Extended Text API
09/24/03	13	Add section on connecting to USB port
09/24/03	21	Added Named Servers

Date	Page	Change
12/4/03	22	Added item 6 to "Setting WEP"
12/4/03	23	Added section on entering WEP keys by barcode
12/4/03	51	Added item 6 and renumbered.
12/4/03	53	Added barcodes for WEPkeys
12/15/04	52	File Server IP is SF not FS
12/15/04	52	Network Name default setting is INSTALL
12/15/05	54	Changed Note 3. Length always 2 digits
1/17/05	1	Added para. about upgrading from V5.x to V6.x in "whats in…"
1/17/05	87	Enhanced explanation of 'Text over Graphics'
1/17/05	61	Added reference to Slideshow Editor and its User Guide in para. 1
3/1/05	54	Added note about characters not to be used in barcodes
3/1/05	38	Added touchscreen modes PointerHScale and PointerVScale.
3/1/05	81	Added Fig 24 Slimline Wall Mount, incremented #'s for later Figs.
3/7/05	53	Barcode for WEPkey Index should be WA000N.
3/7/05	52	Barcodes for 3 antenna settings should begin SA not AS.
3/7/05	43	Added data format for MSR
11/16/05	85	Added UnitConfig "Greeting Screen" message for VF displays
11/16/05	89	Appendix J adds FTP site
11/16/05	42	Touchscreen inputs—add tables to show how its done internally
11/16/05	50	Appendix A—barcode scanner lockout
11/16/05	4,5,6	Wiring for slimline Scanvue—added pics and removed old ScanVue pics
11/16/05	All	Revised to Version N of User Manual
11/16/05	1	Description of ScanVue models
3/21/06	44	Rewrote start/end event mask description for clarity
3/21/06	5	Add description of co-located printer
3/21/06	78	Add outline dimensions of co-located printer bracket to Appendix F
3/21/06	2	Add description of demo mode
3/21/06	1	Revised to Version P of User Manual-changed model# to Tx05-4
7/12/06	1	Revised to Version R of User Manual.
7/12/06	1	Updated to V6.20. Linux kernel 2.6x implemented

Date	Page	Change
7/12/06	40	Added KeepAliveTime mode option to port 1283 for TRUS
7/12/06	14, 57	Scanvue.ini and realscan.ini files interchangeable file names
7/12/06	92	Added Appendix K—Running an Open Socket
7/12/06	25	Added WPA/WPA2 security for wireless
7/12/06	4	Added IEE part # for Universal RS232 Y cable
8/15/06	55	Added info on RoHS Metrologic scanner IS3480
6/16/08	31	Added WPA settings, removed incorrect WPA references
6/16/08	29,30,59	Updated WEP features tables
6/16/08	--	General text cleanup
6/16/08	42	Added Port3 configuration with MSR info
6/19/08	96	Moved Network Diagnostics to Appendex L